Draft Compatibility Determination

Title

Draft Compatibility Determination for Commercial Tree Harvesting on Santee National Wildlife Refuge, Clarendon County, South Carolina

Refuge Use Category

Agriculture, Aquaculture, and Silviculture

Refuge Use Type(s)

Tree harvesting (commercial)

Refuge

Santee National Wildlife Refuge (NWR)

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

Santee NWR was established in 1941.
Establishing and Acquisition Authorities are:
". . . for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. 715d (Migratory Bird Conservation Act)
"...to conserve and protect migratory birds...and other species of wildlife that are listed...as endangered species or threatened species and to restore or develop adequate wildlife habitat." 16 U.S.C. 715i (Migratory Bird Conservation Act)
"... 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 "... the Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors ..." 16 U.S.C. 460k-2 (Refuge Recreation Act (16 U.S.C. 460k-460k-4), as amended).

National Wildlife Refuge System Mission

The mission of the National Wildlife Refuge System (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 (CD) re-evaluates and replaces the 2008 CD for Compatibility Determination for Commercial Tree Harvesting on Santee National Wildlife Refuge, Clarendon County, South Carolina. The Commercial Tree Harvesting use has been conducted on the refuge since 2008.Commercial tree harvesting was evaluated in conjunction with the Santee NWR Comprehensive Conservation Plan, associated Environmental Assessment, Finding of No Significant Impact and Compatibility Determination (CCP/EA/ FONSI/CD, U.S. Fish and Wildlife Service [USFWS] 2008a, 2008) and found to be compatible. This use is being reevaluated because every 10 years for non-wildlife dependent recreation uses per policy and the release of the Draft Spatial Habitat and Species Management Plan.

What is the use?

The use is commercial tree harvesting for forest management and includes the cutting and removing of trees by various techniques, such as selective cutting or clear cutting, for sale or commercial use as wood, paper, chips, other fiber products, or firewood. This is a refuge management economic use (603 FW 2.6 N, USFWS 2000).

Commercial tree harvest for forest management would primarily be used to preserve, diversify, and restore forest structure and composition to create and improve wildlife habitat, thus supporting the refuge's purposes and goals to manage and improve habitat for priority wildlife species.

This use includes a variety of silvicultural practices, such as (1) pre-commercial and commercial thinning and release cuttings to remove pole or pulpwood, (2) regeneration cuts such as seed tree, selection, and shelterwood cuts, which would yield products ranging from pulpwood to saw timber, and (3) salvage cuts performed as a result of storm, insect, or disease damage, which could result in the sale of any or all of the above mentioned forest products.

Is the use a priority public use?

No

Where would the use be conducted?

Santee NWR is approximately 13,000 acres and is located within the Atlantic Coastal Plain of east-central South Carolina. The refuge also lies within the 110,000-acre Lake Marion Reservoir. Major landcover types found on the refuge include mixed hardwoods, mixed pine hardwoods, pine plantations, marsh, croplands, old fields, ponds, impoundments, and open water. When forests are outside biologically established desired conditions, commercial tree harvesting may be deemed a necessary option to restore habitats toward desired conditions to support resources of concern. This use may occur throughout the refuge at the Bluff, Cuddo, Dingle Pond and Pine Island Units based on habitat management needs and available resources (See Spatial Habitat Management Plan (SHMP) USFWS 2024).

When would the use be conducted?

Commercial tree harvesting could occur year-round during daylight hours. Activities such as planning and inventorying, tree marking, harvesting, harvest monitoring, and other tasks could occur at various times throughout the year and as outlined in the Implementation of Forest Habitat Management Practices on National Wildlife Refuge System in the Southeast Region for Tree Roosting Bats Biological Opinion (Bat BO; USFWS 2024a). Harvesting generally occurs during dry periods but depends on environmental conditions such as the site characteristics, resources of concern, and the purpose of the harvest.

All forest management would occur at designated times to minimize unwanted impacts on resources (e.g., erosion, soil compaction, or wildlife disturbance) while maximizing the desired silvicultural results, such as plantings, seed germination, and natural tree regeneration. Management objectives would focus on the conversion of loblolly pine to longleaf pine. Thinning would also be conducted in the mixed hardwood-pine woodlands to support painted bunting and other Neotropical songbirds (USFWS 2024).

The Refuge has seasonal closures during the annual waterfowl sanctuary periods (November 1 to March 1) at the Bluff, Cuddo and Pine Island Units. During hunting seasons, public access is restricted intermittently in late September to early November, and late February to early March.

How would the use be conducted?

Prospective bidders would be sought based on their demonstrated ability and willingness to comply with standard operating procedures, developed to ensure the protection of natural and cultural resources during timber harvests. Bids would be reviewed by refuge staff in consultation with the Division of Contracting and General Services and other U.S. Fish and Wildlife Service (Service) staff with experience in forest management. The successful bidder would be issued a contract and a SUP to conduct the timber harvest project, with special conditions that include operating procedures, best management practices, time-of-year restrictions, and other conditions as necessary to ensure a satisfactory operation and to minimize impacts on resources. Best management practices including but not limited to selective logging methods, equipment with reduced ground disturbing capabilities, and time of year and soil-moisture restrictions may be implemented to minimize disturbance to wildlife and understory vegetation, depending on current site conditions (USFWS 2024a and 2024). Other BMPs such as pre-harvest multi-resource surveys, strategic layout of skid trails, and clear designation of no-cut zones may also be implemented to help protect wildlife and habitat (USFWS 2024a).

Before beginning commercial tree harvest, a step-down forest management prescription would be developed. The forest management prescription would identify refuge resources of concern, describe current forest conditions, outline desired

future forest conditions, and explain the processes and treatment required to transition the forest into its desired condition. Additionally, a Section 106 (cultural resources review) and Section 7 intra-service consultation would be completed before the prescription is approved for implementation. Finally, the SUP would outline stipulations necessary to meet refuge objectives.

Why is this use being proposed or reevaluated?

This use is being reevaluated due to the renewal period pursuant to Service policy (603 FW 2.11 H., USFWS 2000). In addition, commercial timber harvest for forest management is prompted by Service policy to ensure that the biological integrity, diversity, and environmental health of the Refuge System is maintained (601 FW 3, USFWS 2006). Commercial harvest is the preferred method to manage refuge forests safely and efficiently in a cost-effective manner. Commercial timber harvest for forest management is necessary to maintain, restore, and create habitat for wildlife species associated with mixed hardwood-pine forests, with upland pine forests and other priority species as listed in the refuge's Comprehensive Conservation Plan and the SHSP (USFWS 2008 and 2024).

Availability of Resources

To comply with the Refuge Recreation Act (Public Law 87-714), the Project Leader must determine whether sufficient resources—financial, staffing, facilities, or other infrastructure—are available to support the proposed use without materially interfering with the refuge purpose(s) or the mission of the National Wildlife Refuge System. This determination should be informed by a review of current capacity and, where applicable, the refuge's Comprehensive Conservation Plan (CCP).

Assessment of current resources and capacity

The refuge manager in consultation with the regional forester and staff would make silvicultural prescriptions and administer all forest-related activities on the refuge. Costs associated with commercial forest management would be dependent upon the scope, goals, and objectives of the operation. With existing staff resources, periodic and small-scale harvest operations can be administered properly and safely and in a way that would not materially interfere with or detract from fulfillment of the refuge purposes and the Refuge System mission (Table 1).

Special Equipment, facilities or improvements: Most operations would involve contract labor or timber sales to forest products companies that provide or contract professional logging crews.

Planning costs: An initial expense of $14,000 is needed to complete the forest management plan and develop signage and brochures prior to conducting forest management activities.

Maintenance Costs: The average cost to support forest management at Santee NWR

is $6,500 annually to post signage and administer and manage the contract.

Off-setting Revenue: Any permit fees or timber sale receipts would not off-set costs since these funds would be deposited into general accounts as opposed to being returned to the refuge.

Table 1. Costs to Administer and Manage [Insert Refuge Use]

Category and Itemization	One-time Cost	Recurring Annual Expenses
Develop Plan/NEPA document/opening package	$10,000	--
Construct facilities	$X,000	--
Supplies and equipment	$X,000	$X,000
Develop and print signage and brochures	$1,500	$X,000
Survey and post use area boundary	$1,500	--
Staff time (law enforcement, administration and management)	$X,000	$4,000
Maintenance	--	$1,500
Monitoring	--	$1,000
Total one-time expenses	**$14,000**	
Total recurring annual expenses		**$6,500**
Offsetting revenues	**-$X,000**	**-$X,000**
Total expenses	**$14,000**	**$6,500**

Commercial Tree Harvesting occurs through the use of existing staff, funding, equipment, and facilities (Table 1). Existing resources such as permit development and project monitoring are made possible through extensive help of staff, volunteers, and partners.

Refuge staff are needed to administer activities such as pre-work coordination, on-site monitoring, post-work inspection, as well as to ensure that the stipulations are met, and to monitor and evaluate impacts of the refuge use.

Impacts of changes to resources and capacity

The availability of resources is subject to change and the level of use provided may vary based on current staffing, partner support, funding, or infrastructure conditions. Costs may increase over time, in relation to changes in the costs for equipment, maintaining facilities, etc. A substantial increase to the number of requests may also create the need for additional resources to administer the use. The Project Leader would use sound professional judgment in evaluating whether the refuge or its partners can develop, operate, and maintain the use in a compatible manner.

For other refuge uses, if resource conditions shift such that the refuge can no longer sustain the use in a compatible manner, the Project Leader may modify or suspend the use pursuant to 50 CFR 25.21. The public would be notified of any changes to refuge uses, including temporary modification or suspension, re-evaluation of compatibility and/or discontinuing of refuge uses.

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”. Floodplains, cultural resources, refuge management and operations, and socioeconomics would not be more than negligibly impacted by the action and have been dismissed from further analyses. Cultural resources were reviewed and no impacts were identified.

Although not a priority public use, commercial tree harvesting can contribute to the mission of the Refuge System when used to support wildlife and their habitats. For example, commercial tree harvesting creates gaps in the forest canopy, allowing light to reach the forest floor and stimulating growth in the understory. This can improve the habitats of various wildlife species. Commercial tree harvesting would allow the Service to implement management techniques that mimic natural disturbance regimes, such as wildfires, ensuring forests remain in optimal condition for wildlife. Optimal forest conditions support priority public uses, such as wildlife observation and photography, by creating suitable habitats for wildlife and attracting various animals to the refuge.

Commercial forest management activities would be designed to minimize adverse impacts on resources (e.g., erosion, rutting, wildlife disturbance), while maximizing the desired silvicultural results, such as forest health improvements and native understory regeneration to benefit wildlife (USFWS 2024a).

Commercial tree harvesting is an existing use on the refuge and was previously analyzed and approved in the 2008 CCP, Environmental Assessment, and Finding of No Significant Impact (EA/FONSI) was previously found not to have significant impacts; was previously determined not to materially interfere with or detract from the purposes of the refuge or the Refuge System mission; and was previously found compatible (USFWS 2008a and 2008).

The CCP/EA/FONSI (USFWS 2008a and 2008) addressed the direct, indirect, short-term, long-term, and cumulative impacts of the use on the refuge. The use and environmental conditions have not changed substantially since that analysis.

No significant beneficial or adverse short-term, long-term, or reasonably foreseeable impacts are associated with non-commercial tree harvesting on the refuge as outlined in this Draft CD. The impacts analysis from the CCP/EA/FONSI (USFWS 2008a and 2008) associated with the use is incorporated herein by reference; only summary and updated impacts are provided in this CD.

Short-term impacts

The increased use and ongoing maintenance of roads, creation of logging decks, and the operation of heavy equipment may impact soil, causing rutting and erosion (Helfrich et al. 1998; Wiest 1998; Cullen 2001). To minimize potential impacts and erosion, timber harvesting operations would follow the best management practices as recommended by the South Carolina Forestry Commission. Timber harvesting would occur during dry periods or colder months to reduce soil erosion, compaction, and rutting. Active forest management would occur when site-specific soil conditions are appropriate.

Forest management operations may have negative impacts on both water quantity and quality. Data from experimental forested watersheds in the eastern United States indicate that the leaching of nutrients after timber harvesting, especially clear cutting, tends to increase (Bormann et al. 1968; Bormann et al. 1974), and the increases in stream water temperature are highest where revegetation of cutover areas is delayed (deMaynadier and Hunter 1995; Cullen 2001). These factors may have detrimental effects on stream organisms, including fish, invertebrates, and amphibians (Campbell and Doeg 1989). Maintaining forested buffers near streams and other aquatic resources minimizes impacts on water resources and water quality (Osborne and Kovacic 1993; Castelle et al. 1994; Wilkerson et al. 2006; Bennett 2010). Road improvements, skid trail planning, harvest operations, and interaction with surface and groundwater hydrology would follow best management practices outlined by the state's forestry agency to minimize water quality impacts. Selective thinning, not clearcutting, would be the primary harvest method.

Commercial tree harvesting for forest management can have several localized and broader impacts on wildlife-related components of forests, including damage to understory vegetation (Scheller and Mladenoff 2002), alterations of microhabitat environments (deMaynadier and Hunter 1995), and changes in the abundance and

type of coarse woody debris (deMaynadier and Hunter 1995; Siitonen 2001).

Harvesting may also leave the remaining trees more susceptible to wind throw (Ruel 1995), facilitate the spread of invasive plants (Sakai et al. 2001), and temporarily disturb wildlife (DeMaynadier and Hunter 1995, Campbell et al. 2007; Holmes and Pitt 2007). Impacts would be minimized through careful planning and implementation. Selective logging methods, equipment with reduced ground disturbing capabilities, and time of year and soil-moisture restrictions would be implemented to minimize disturbance to wildlife and understory vegetation. Pre-harvest multi-resource surveys, strategic layout of skid trails, and clear designation of no-cut zones would also help to protect the wildlife and habitat.

Positive impacts are expected from tree harvesting. In a study conducted in the bottomland hardwood forests at Tensas River National Wildlife Refuge, treated stands resulted in greater community-wide bird diversity in comparison to untreated stands (Twedt and Somershoe 2009).

The combination of human presence, noise associated with heavy equipment and motorized hand tool operation may disturb wildlife, including birds. Birds exhibit various behavioral and physiological responses to disturbance. Physiological responses include the release of stress hormones (Müllner et al. 2004, Thiel et al. 2008) and increased heart rate (Weimerskirch et al. 2002). Behavioral responses include increased vigilance (Frid and Dill 2002), altered singing behavior (Gutz Wilder et al. 1994), and flushing (Ikuta and Blumstein 2003, Beale and Monaghan 2004, Pease et al. 2005, Livezey et al. 2016). Disturbance can also cause birds to discontinue or avoid foraging (Burger and Gochfield 1998, Thomas et al. 2003, Yasue 2005, Martín et al. 2015) and instead spend more time displaying avoidance behaviors. These physiological and behavioral responses to human activity cause birds to expend energy (Bélanger and Bédard 1990, Weimerskirch et al. 2002) that would otherwise be used for survival, migration, and reproduction.

Bald eagles, although delisted under the Endangered Species Act, remain protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (16 U.S.C. 668a–d). The Eagle Act prohibits the “take” of eagles, including disturbance that interferes with essential breeding, feeding, or sheltering behaviors. Bald eagles are regularly present on the refuge, and four known nests have been documented. Refuge habitats provide suitable foraging and nesting opportunities, and existing management practices already incorporate avoidance and minimization measures to prevent disturbance during sensitive periods.

The wood stork is a resource of concern on the refuge. Wood storks use wetland habitats for foraging and loafing; no nesting has been documented. Potential disturbances to wood stork may include noise from management activities, vehicular traffic, and trampling of vegetation. However, these disturbances would be short in duration and have minimal impacts. Therefore, tree harvesting is not likely to adversely affect this species.

Amphibians and reptiles may be negatively impacted through various mechanisms. Falling trees could crush amphibians and reptiles, killing them. Ectotherm species are susceptible to short-term changes in microclimates, which should be considered when harvesting to limit adverse impacts (Currylow et al. 2012). For example, tree harvesting can increase sunlight penetration to the forest floor, reducing soil moisture and increasing soil temperatures. These microclimate changes can cause cold-blooded animals to overheat and make amphibians vulnerable to desiccation.

Tree harvesting has the potential to disturb and displace bats during and after harvesting operations. Specifically, Northern long-eared bat (NLEB) and Tri-colored bat (TCB) are tree roosting bats and would be considered during these proposed operations. Tree harvest such as thinning is likely beneficial to forest-dwelling bats. However, when removing trees from suitable bat habitat, there is the immediate risk of removing trees utilized by bats. The retention of snags and cavity trees as part of the harvest help to reduce adverse effects and long-term negative impacts and this practice should be beneficial to tree roosting bats. This and other best forest management habitat practices would be implemented to minimize adverse impacts to bats (USFWS, 2024a). Therefore, tree harvesting is not likely to adversely affect bat species.

While Santee NWR is in the general range of NLEB, this species has not been detected on the refuge. Based on this current scenario, NLEB are not likely to be adversely affected by timber harvesting on the refuge. TCB is common and has been detected on the refuge. The TCB is a migratory species that may remain active year-round in South Carolina. Minimizing disturbance to summer bat habitat is essential to ensure bats have access to diurnal roosting sites and nocturnal foraging areas. Tree harvesting can alter suitable habitat depending on multiple factors, including the species of bat and habitat requirements across all life stages (Pauli et al. 2015). Requiring harvest activities to occur between November 15 and March 31 would reduce impacts on habitats used by bats during the summer.

Six federally threatened and endangered (includes two proposed) species are known to or potentially occur on the refuge, but this use is not expected to conflict with recovery or protection of these species and there have been no reported/documented issues. Federally listed threatened and endangered Species that have been documented to potentially occur within the acquisition boundary of the refuge are the tricolored bat (*Perimyotis subflavus*), proposed endangered, West Indian Manatee (*Trichechus manatus)*, threatened, Red-cockaded Woodpecker (D*ryobates borealis*), threatenened, monarch butterfly (D*anaus plexippus)* candidate, American Chaffseed (*Schwalbea Americana),* endangered, and Canby's Dropwort (*Oxypolis canbyi*), endangered. No critical habitat is designated within the refuge area. Temporary disturbance to these species may result from land management activity.

Tree harvesting can impact vegetation and soil. Harvesting a tree causes it to die, and harvesting may leave remaining trees more susceptible to wind throw (Ruel 1995).

Further, tree harvesting can facilitate the spread of invasive plants (Sakai et al. 2001). Removing trees from the forest can result in fewer large-diameter logs and detritus accumulating on the ground, which could negatively impact plants, soil, amphibians, invertebrates, and other wildlife species that inhabit the forest floor.

Heavy equipment could be required for tree harvesting, depending on the magnitude of the harvesting operation. Heavy equipment can damage uncut trees, creating entry points for invasion by insects or disease (Nichols et al. 1994). The construction and maintenance of roads and landings and heavy equipment operation may impact soil, causing rutting and erosion (Helfrich et al. 1998, Wiest 1998). The consequences of compacted soil include increased soil temperatures, reduced moisture (Marion et al. 2016), reduced soil biota (Liddle 1997), and resistance to seed germination and penetration by plant roots (Alessa and Earnhart 2000). Further, heavy equipment can introduce or spread invasive species and crush small animals. Best management practices would be used to protect refuge resources from being damaged by heavy equipment.

The noise associated with tree harvesting could disturb visitors and impact their safety. To ensure visitor safety, areas of the refuge where tree harvesting occurs may be temporarily closed.

Long-term impacts

Tree harvesting can have long-term localized and broad impacts on wildlife and their habitats, including damage to understory vegetation (Scheller and Mladenoff 2004), alteration of microhabitat environments (deMaynadier and Hunter Jr. 1995), changes in the abundance and type of coarse woody debris (deMaynadier and Hunter 1995, Siitonen 2001), and removal of snags used by wildlife. Depending on their life history characteristics, these impacts can have positive and negative long- term effects on wildlife populations. For example, birds that prefer early successional and shrubby habitats may benefit from tree harvesting, while birds that prefer mature, old-growth forests may decline (Campbell et al. 2007, Holmes and Pitt 2007). Other wildlife, such as amphibians, invertebrates, reptiles, and mammals, may also be affected differently based on their life history traits (Fredericksen et al. 2000).

Using tree harvesting to mimic natural disturbance and improve wildlife habitats relies on creating appropriately timed disturbances similar in size and intensity to historical disturbance regimes (Seymour et al. 2002). Because wildlife species have differing requirements for cover, food, and nesting sites, it is not possible to use tree harvesting to provide high-quality habitat for all species in the same stand.

Some plants and animals may respond more positively to less intense tree harvesting, while others may respond more positively to more intense tree harvesting. Further, disturbance-dependent species may be positively impacted immediately following tree harvesting but may decline long-term (Cahall et al. 2013). To maximize the positive effects of tree harvesting and minimize harm, the Service would aim to mimic the size and intensity of historical disturbance regimes. The Service would also

implement rotational tree harvesting to create a complex habitat matrix with various successional stages while maintaining unthinned areas for species negatively impacted by thinning.

Tree harvesting can have long-term impacts on soil chemistry, with impact intensity based on the harvest method. Whole tree harvesting, or the practice of cutting the entire above-ground portion of a tree and removing it from the forest, typically has the most severe effects and has been documented to increase soil acidity, decrease soil saturation, and alter nutrient concentrations (Vanguelova et al. 2010, Brandtberg and Olsson 2012). Soil disturbance following timber harvest may increase the export of particulate matter and soil nutrients. To reduce the possibility of negatively impacting soil, the Service would conduct timber harvesting during the fall and winter when conditions are driest and when cold temperatures reduce soil compaction and erosion. The Service would apply extra caution when performing management in areas with hydric, steep, shallow, or easily erodible soils.

Research has shown that tree harvesting can affect water quality. For example, several studies have suggested that total mercury and methylmercury leach into the water from tree harvesting areas (Munthe and Hultberg 2004, Porvari et al., 2003, Sørensen et al. 2009). All forest management measures, including harvesting, can increase sediment and nutrient export into the watershed (Ahtiainen and Huttunen 1999, Laurén et al. 2005, Miettinen et al. 2012). Although tree harvesting can cause increases in nutrient concentrations in the watershed, implementing best management practices can minimize these increases (Wynn et al. 2000).

Road construction, skid trail planning, harvest operation, and stream crossings would, at a minimum, follow the best management practices from the State's forestry agency to minimize hydrological alterations and siltation impacts on water quality. Harvesting would use existing forest roads whenever possible; construction of new roads would occur only when necessary. The decommission of forestry roads would be standard practice after all forest management is completed.

Invasive species could be introduced via heavy equipment, creating a long-term problem. Once present, invasive species can out-compete native plants and animals, thereby altering habitats (Marion et al. 2006, Anderson et al. 2015). Invasive species can alter animal and plant composition, diversity, and abundance (Eiswerth et al. 2005, Davies and Sheley 2007). These changes may reduce native forage, cover, and water sources (Eiswerth et al. 2005). Certain invasive species may even impede access to other recreational activities, such as hydrilla, which blocks waterways.

The long-term impacts on refuge user groups are anticipated to be positive because forest management may increase the presence of wildlife, facilitating wildlife observation and photography, environmental education, wildlife interpretation, and hunting and fishing.

Public Review and Comment

The draft compatibility determination would be made available for public review and comment for 30 days, from June 26 through July 26th and would be posted on the Refuge Website (https://www.fws.gov/refuge/santee) Additionally, a hard copy of this document would be posted at the Refuge Headquarters and Visitor Center at 2125 Fort Watson Road, Summerton, SC 29148-8638 during the same period. Please let us know if you need the documents in an alternative format. Concerns expressed during the public comment period would be addressed in the final determination.

Determination

Is the use compatible?

Yes

Stipulations Necessary to Ensure Compatibility

Prior to implementation of a commercial tree harvest, a step-down forest management prescription would be developed that minimally identifies refuge resource of concern, describes current condition, describes desired future condition and identifies process and treatment(s) to move forest toward desired condition. Additionally, Section 106 (cultural resources) and Section 7 (ESA intra-service consultation) is completed before each prescription is approved for implementation. Finally, the refuge SUP identifies necessary stipulations to meet refuge objectives. Ensuring project implementation specifically supports refuge plans (e.g. CCP, HMP, Forest Management Prescription) and includes appropriate conservation measures such as monitoring and BMPs to support refuge habitat objectives to ensure compatibility.

1. All commercial forest management operations would be subject to stipulations set forth in a Special Use Permit (SUP). Stipulations for each individual project would be dependent upon the goals and objectives of the timber harvest, individual site characteristics, and other resource concerns. Stipulations set forth in the SUP would minimize adverse impacts on resources, maximize desired silvicultural results, and ensure the operation is compatible with the mission of the Refuge System and the goals and objectives of Santee NWR.
2. Commercial harvesters would be selected through a bid process. Each contractor would submit a bid for the service identified.
3. An SUP would be issued to the selected harvester. The SUP would provide specific guidance on location, timing, methods allowed, and any restrictions applied to the specific contract.
4. The harvester would remove all temporary access roads upon completion of harvest.
5. The harvester would provide a summary of all trees removed and other

accounting information as specified.

6. To minimize impacts and to ensure the continued compatibility of the forest harvesting use, the Service uses the SHMP (USFWS 2024) to guide the development of specific forest management prescriptions which are then used to mark targeted trees, select a commercial bidder, and issue an SUP for the specific tree harvesting site and action.
7. Commercial harvesters must adhere to all SUP conditions and restrictions.
8. The Service may revoke or modify any SUP to address resource concerns, unacceptable impacts, non-compliance, or public safety.
9. Commercial harvesters must adhere to the South Carolina Best Management Practices for Forestry Manual (South Carolina Forestry Commission 2021).
10. To minimize adverse impacts, the existing network of roads and trails would be used for timber activities.
11. Only heavy equipment that meets current industry standards for air and noise pollution would be used.
12. Equipment use would be allowed only during specified time frames. Logging activities usually last approximately one month out of the year.
13. Harvesting would not occur too close to private homes.
14. Harvesting would only occur during daylight hours.
15. Harvesting operations can occur only within the refuge boundaries.
16. All harvesting operations and timber removal sold shall be subject to safety and security rules and regulations, including those related to fire, necessary for the protection of government personnel and property, as outlined by the refuge manager or designated official. The purchaser's timber harvesting operations shall conform to the Occupational Safety and Health Administration's (OSHA's) logging safety standards as prescribed in logging operations in 29 CFR §1910.266, equipment lock- out/tag-out standards in 29 CFR §1910.147, and hazardous communication standards in 29 CFR §1910.1200. Copies of these safety standards may be obtained from the OSHA website at https://www.osha.gov/.
17. Liability insurance is required of all commercial harvesters.
18. A pre-entry conference between the refuge manager or designated refuge staff and the permittee or designated representative would be required before logging operations begin. The purpose of the pre-entry conference is to minimize conflicts by ensuring that the permittee completely understands what is expected.
19. All wildlife on the refuge are protected. All reasonable efforts would be made by the permittee to protect wildlife from harm and harassment.

20. All logging would be within the boundaries specified on the map attached to the SUP.
21. When marked trees are to be cut, trees would be cut to leave ground-level paint spots visible after the tree has been cut. All marked trees are to be cut, except for marked leave trees in shelterwood, seed tree, or small open areas as described in the SUP.
22. When only marked or designated trees would be cut, care would be taken to protect all other trees and vegetation from damage. Unmarked trees that are cut or injured through carelessness would result in a fine of $5 per inch diameter at stump height, or breast height if present.
23. Trees and tops would not be left hanging or supported by any other tree and would be laid down immediately after felling.
24. Tops and logging debris would be lopped to within 6 feet of the ground in all areas 100 feet or less from major roads.
25. All roads, rights-of-way, active agricultural fields, designated openings, ditches, and streams must be kept clear of tops and debris.
26. The permittee is required to repair all damages resulting from harvesting operations conducted under the SUP.
27. The skidding of logs greater than 20 feet in length may be prohibited in designated areas.
28. The refuge manager or designated official must approve the location of additional roads. Additional trees removed for roads or loading sites would be marked by designated refuge staff and paid for at bid price.
29. Loading of forest products on public roads or shoulders or on regeneration areas is prohibited.
30. Logging would not be permitted when the ground is wet and subject to rutting and severe compaction. The permittee and employees would do all within their power to prevent rutting and erosion.
31. The permittee and employees would do all within their power to prevent and suppress forest fires. Fires would be reported immediately to the refuge office.
32. Ownership of all products remaining on a sale area would revert to the government upon termination of the permit.
33. Littering in any manner is a violation of the Code of Federal Regulations. The entire work area would be kept free of all litter.

Justification

The stipulations outlined above would help ensure that the use is compatible at Santee NWR. Commercial Tree Harvesting as outlined in this compatibility

determination, would not conflict with the national policy to maintain the biological diversity, integrity, and environmental health of the refuge. Based on available science and best professional judgement, the Service has determined that the Commercial Tree Harvesting at Santee NWR in accordance with the stipulations provided here, would not materially interfere with or detract from the fulfillment of the National Wildlife Refuge System mission or the purpose of the Santee NWR. Rather, appropriate and compatible Commercial Tree Harvesting would be the use of the Santee NWR. through which the public can develop an appreciation for wildlife and wild lands.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

Mandatory Reevaluation Date

2036

Literature Cited/References

Alessa, L. and C. G. Earnhart. 2000. Effects of soil compaction on root and root hair morphology: Implications for campsite rehabilitation. In Cole, D. N., S. F. McCool, W. T. Borrie, J. O Loughlin (comps.). 2000. Wilderness science in a time of change conference-Volume 5: Wilderness ecosystems, threats, and management; 1999 May 23 27; Missoula, MT. Proceedings RMRS-P-15-VOL-5.

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