

Draft Compatibility Determination

Tree harvesting for biomass removal to reduce hazardous fuel, control invasive species, and improve habitat for imperiled wildlife species on Harris Neck National Wildlife Refuge.

Refuge Use Category

Agriculture, Aquaculture, and Silviculture

Refuge Use Type(s)

Tree Harvesting (commercial)

Refuge

Harris Neck National Wildlife Refuge (NWR), McIntosh County, Georgia

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

Harris Neck:

- "... particular value in carrying out the national migratory bird management program. 16 U.S.C. Â§ 667b (An Act Authorizing the Transfer of Certain Real Property for Wildlife, or other purposes)
- "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." 16 U.S.C. Â§ 715d (Migratory Bird Conservation Act)
- "... the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions ..." 16 U.S.C. Â§ 3901(b), 100 Stat. 3583 (Emergency Wetlands Resources Act of 1986)

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 2011 compatibility determination for timber harvest. The 2011 compatibility determination “Timber Harvest” was evaluated and found to be compatible in conjunction with the Savannah Coastal National Wildlife Refuge Complex Comprehensive Conservation Plan, Environmental Assessment, and Finding of No Significant Impact (CCP/EA.FONSI; U.S. Fish and Wildlife Service [USFWS] 2010, 2011). The use is being reviewed to satisfy the U.S. Fish and Wildlife Service’s (Service, USFWS) policy (603 FW 2.11 H.) to reevaluate non-priority public uses every ten years.

What is the use?

The use is commercial tree harvesting. Commercial tree harvesting is defined as “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, Christmas trees, or firewood.” In this case, we intend to use commercial tree harvesting as a method of biomass removal to reduce hazardous fuels, control invasive species, and improve habitat for resident, migratory and imperiled wildlife species.

Is the use a priority public use?

No

Where would the use be conducted?

This use would be conducted primarily within established pine and hardwood stands scattered across the landscape of Harris Neck NWR. These areas would be overall improved for certain wildlife species found there, including painted bunting

(*Passerina ciris*), Bachman's sparrow (*Peucaea aestivalis*), various woodpeckers, tricolored bat (*Perimyotis subflavus*), gopher tortoise (*Gopherus polyphemus*), eastern diamondback rattlesnake (*Crotalus adamanteus*), and many others.

When would the use be conducted?

This use could begin as soon as all applicable compliance requirements are fulfilled and end ten years after the approval date, when the use would need to be re-evaluated. Commercial tree harvesting could occur year-round, with activities such as planning and inventorying, tree marking, harvesting, harvest monitoring, and various other tasks occurring at different times throughout the year. The harvesting portion of the process generally occurs during dry periods but depends on various environmental conditions, site characteristics, resource concerns, and the purpose of the harvest. All forest management would occur at times designed 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. This use would occur only during daylight hours and outside of the primary nesting season for most migratory land birds and the tricolored bat pupping season (Florida Fish and wildlife Conservation Commission 2024, USFWS 2024a, b).

How would the use be conducted?

Mechanical biomass removal operations through commercial tree harvesting would be conducted on suitable sites in forested areas needing management. Several crews using rubber-tracked forestry mulching machines, forestry whole tree chipping equipment, and/or other Service approved actions would be employed to remove an overgrown midstory of various shrubs, hardwoods, and loblolly pine advanced regeneration with the goal of creating sufficiently open (shade-free) conditions for the development of a diverse native understory. Measurable objectives would be to reduce hazard vegetative fuel loads by 95% and promote an understory dominated by at least 75% coverage of native warm-season grasses. Once completed, the resulting native forest communities would be suitably managed in desirable conditions with frequent, low-intensity prescribed fires while maintaining biological diversity and ecological resiliency.

Why is this use being proposed or reevaluated?

This use is being reevaluated pursuant to the National Wildlife Refuge System Improvement Act (PL 105-57) and Service Compatibility Policy (603 FW2), which

require review and reevaluation of non-priority refuge uses every ten years. Further, commercial tree harvesting is an important habitat management tool commonly used in coastal forested areas that can be used to improve the refuge's habitats for wildlife, reduce wildfire risk, and increase the area's resiliency against environmental and climate change plus other threats. These areas would be improved for certain wildlife species including painted bunting, Bachman's sparrow, numerous woodpecker species, tricolored bat, gopher tortoise, eastern diamondback rattlesnake, and many others. Commercial management practices are the preferred method to manage refuge forests safely, efficiently, and effectively while containing costs. It is impractical for the refuge to acquire the necessary equipment and staffing skill and proficiency to efficiently conduct these management actions.

Availability of Resources

Since commercial timber harvest will be conducted exclusively through 3rd party contracts, the reliance on existing refuge personnel should be minimal. Funding resources are impossible to predict and will be dependent on annual appropriations and administration priorities and funding opportunities.

Refuge and/or regional planning staff would be primarily responsible for plan development and environmental law obligations, the development and installation of signage to inform visitors, posting project boundary areas, and conducting periodic site visits to ensure compliance with established refuge regulations and project stipulations. Biologists, visitor service specialists, and refuge managers are responsible for completing these tasks which can be done in conjunction with site visits for other purposes, such as wildlife surveys, maintenance, and other necessary operations.

In all circumstances, the contracted partners would be primarily responsible for all mechanical actions, including mulching, chipping, felling, and/or other Service-approved techniques, to accomplish the objectives of hazard fuel reduction, invasive species control, and wildlife habitat enhancement.

Table 1. Costs to Administer and Manage Commercial Tree Harvesting , Harris Neck NWR

Category and Itemization	One-time Cost	Recurring Annual Expenses
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Develop Plan/NEPA document/opening package	\$3,000	\$0
Remove biomass	\$228,000	\$0
Develop signage and brochures	\$300	\$0
Survey and post use area boundary	\$500	\$0
Staff time (LE, administration and management)	\$7,000	\$0
Maintenance	\$0	\$0
Monitoring	\$0	\$200
Total one-time expenses	\$238,800	NA
Total recurring annual expenses	NA	\$200
Offsetting revenues	\$0	\$0
Total expenses	\$238,800	\$200

Anticipated Impacts of the Use

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

Although not a priority public use, commercial tree harvesting can contribute to the mission of the Refuge System by improving overall forest health. The use would be primarily aimed at hazard fuel reduction, control of invasive species, and in some specific cases, preparation for longleaf pine forest restoration. Commercial tree harvesting provides the Service with the most cost-effective management technique with the goal of providing a more natural and diverse habitat. This use would also reduce the threat of potentially damaging wildfire, improve wildlife habitat diversity and quality, and provide higher aesthetic value for refuge visitors. Optimal forest conditions support priority public uses such as wildlife observation and photography, by creating enhanced habitat for wildlife and attracting a variety of common, as well as imperiled species, to the refuge.

Commercial tree harvesting is an existing use on the refuge and was previously analyzed and approved in the 2011 CCP/EA/FONSI (USFWS 2010, 2011). It was previously found to not 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 not to conflict with maintaining the biological integrity, diversity, or environmental health of the refuge (USFWS 2010, 2011).

The CCP/EA/FONSI (USFWS 2010, 2011) 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 the use was evaluated in 2011. No significant beneficial or adverse short-term, long-term, or cumulative impacts are associated with commercial tree harvesting on the refuge as outlined in this CD. The impacts analysis from the CCP/EA/FONSI (USFWS 2010, 2011) associated with the use is incorporated herein by reference; only summary and updated impacts are provided in this CD.

The effects and impacts of commercial tree harvesting covered in this CD, whether adverse or beneficial, are those that are reasonably foreseeable and have a reasonably close causal relationship to the uses. Resources that would not be more than negligibly impacted by the use have been dismissed from further analysis. The refuge manager may modify or eliminate the use at any time to address resource concerns, unacceptable impacts, and public safety needs or to adapt to changing conditions.

Short-term impacts

The noise associated with heavy equipment is the primary short-term impact of this use. The use may disturb some wildlife species, particularly birds that may be in the local area. Birds exhibit various behavioral and physiological responses to disturbance. Disturbance can 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. Tree harvesting operations would be completed only during daylight hours and generally outside of the primary nesting season for most locally nesting migratory land birds. The refuge hosts thousands of visitors each year and regularly uses heavy equipment for a variety of reasons; thus, many of the bird species found on the refuge are likely habituated to loud, sudden noises from the use of heavy equipment, vehicles, lawnmowers, and chainsaws.

Amphibians and reptiles may be negatively impacted through tree harvesting in the short-term. Falling trees and heavy equipment operation could directly kill amphibians and reptiles but likely in negligible numbers. For the benefit of amphibians, reptiles, and detritus thriving insects, all tree harvesting use would be completed by maintaining and/or creating coarse woody debris on the forest floor at a rate of at least 1 ton per acre (USFWS 2024a), and operations would be halted and/or modified if areas were experiencing soil rutting.

Tree harvesting has the potential to disturb and temporarily displace bats from the project area during and immediately after harvest operations. Minimizing disturbance to spring and early summer tricolored bat pupping habitat is essential to ensure they are not harmed or harassed. Due to the pending federal listing of the tricolored bat as endangered, all tree harvesting on the refuge would occur outside the pupping season in the local area, which occurs from May 1 to July 15 (USFWS 2024b).

Heavy equipment operation is necessary for tree harvesting and would have short-term impacts on vegetation and soils in localized areas, with those impacts expected to be negligible because the refuge would ensure all stipulations are followed. Additionally, heavy equipment can damage leave trees, creating entry points for invasion by insects or disease (Nichols et al. 1994). The construction and maintenance of roads and landings may impact soil, causing rutting and erosion (Helfrich et al. 1998, Wiest 1998). To minimize impacts on vegetation, soils, and wildlife habitat, the Service would strictly enforce all stipulations necessary to ensure compatibility, including inspecting equipment for invasive species and postponing operations if soil rutting is detected to protect the refuge's resources from being damaged by heavy equipment (USFWS 2024a). No new roads would be constructed on the refuge to facilitate tree harvesting operations, and existing roads damaged by heavy equipment would be restored to a state equal to or better than before the use occurred.

The noise associated with tree harvesting could disturb visitors while heavy equipment and truck movements could endanger their safety in the short-term. Stipulations to ensure compatibility and protect visitors' safety include requiring contracted personnel to pay close attention to avoid harm to curious refuge visitors who may wander into areas where the use is being conducted. Contractors would place orange cones adjacent to daily operation areas along all nearby established trails and roads (USFWS 2024a). Daily use of the wildlife drive by contractors in and out of the refuge is of paramount concern regarding visitor safety. The refuge's visitor services staff would develop notification signage to inform visitors of any

ongoing work. Also, all information would be regularly updated on refuge websites and social media so as to minimize impacts to visitors to the greatest practical extent.

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 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). Tree harvesting on the refuge is intended to improve understory vegetation for various wildlife species that depend on this ever-lacking component of forest habitat. Additional positive long-term impacts from targeted commercial tree harvesting on the refuge would result in the conservation of and/or the increase in the number of snags per acre and the amount of coarse wood debris per acre. Potential benefits could be the presence of multiple snags per acre, (when and where it is safe to leave them standing), and at least 1 ton of coarse, woody debris on the forest floor per acre.

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 at the same time. 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-associated 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, which in coastal areas of Georgia are primarily due to the prevalence of wildfires and hurricanes.

Tree harvest operations such as skid trail planning, harvest operations, and wetland avoidance would, follow the best management practices from the Georgia Forestry Commission (Georgia Forestry Commission 2019) to minimize hydrological

alterations and siltation impacts on water quality. Harvesting would use existing forest roads; no new roads would be needed.

Invasive species could potentially be introduced through heavy equipment use, creating a long-term ecological 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). Stipulations for conducting the tree harvesting use include cleaning all heavy equipment of off-site soil and plant material prior to entering the refuge. This use is intended to control the introduction of invasive species, rather than introduce them.

The long-term impacts on refuge user groups are anticipated to be positive because forest management would increase the presence of certain wildlife species and enhance aesthetics. This would facilitate improvements in visitor experiences related to wildlife observation, wildlife photography, environmental education, environmental interpretation, and hunting.

Public Review and Comment

The draft compatibility determination will be available for public review and comment for 33 days, from May 9th, 2024 to June 10th, 2024. The public will be made aware of this comment opportunity through the refuge website and Facebook page. The State and Tribes have been asked to review and comment on the draft compatibility determination. A hard copy of this document will be posted at the Refuge Visitor Center, 694 Beech Hill Lane, Hardeeville, SC 29927. It will be made available electronically on the refuge website (www.fws.gov/refuge/harris-neck). 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. All treated vegetation would be mulched to soil level and/or chipped and hauled off-site.
2. All desirable live oak and laurel oak areas would be selectively treated based on stem density and recommendations from the refuge biologists and refuge managers.
3. Longleaf pine in established plantations would only be selectively treated after consulting with refuge biologists and refuge managers.
4. All Chinese tallow tree (*Triadica sebifera*), Chinaberry (*Melia azedarach*), mimosa (*Albizia julibrissin*), and other invasive trees encountered during mechanical operations, regardless of diameter, would be mulched/chipped to the soil level.
5. Contractors are responsible for transporting all equipment to and from the use sites.
6. Refuge biologists would provide a shapefile to contractors defining the use's spatial boundaries.
7. Equipment operators would avoid all wetlands that are scattered across the use area.
8. All contracted personnel would pay close attention to avoid harm to refuge visitors that may wander into the area of operations. Contractors would place orange cones adjacent to daily operation areas along established trails.
9. Equipment operators would avoid all identified cultural resources near or within the project area. If previously unidentified and/or potential cultural resources are discovered during project operations, contractors would pause work and contact the refuge manager or designee for consultation with USFWS archeological program staff.
10. Operations would be suspended if weather conditions are such to cause excessive rutting and/or damage to access roads.
11. Refuge biologists and refuge managers have the authority to halt operations anytime for unfavorable weather, damage to non-target vegetation, or non-cooperative operators.
12. Contractors shall be responsible for repairing any damage done by field crews to gates, fences, access roads, signs, structures, and any other infrastructure.
13. Refuge biologists and refuge managers would monitor all operations with frequent on-site inspections.

14. No littering would be tolerated, and all garbage, including empty containers of hydraulic fluid, engine oil, and other materials, must be removed daily.
15. All equipment used by the contractor would be cleaned off-site, including removing soil and plant material, before entering the refuge. If equipment leaves the work site for any reason, it would be cleaned before re-entering the refuge. This requirement limits the potential for the spread of exotic and invasive plants onto the refuge.
16. Contractors would take every precaution necessary to prevent damage to leave trees.
17. All operations under this use would comply with National Environmental Policy Act, Endangered Species Act Section 7, National Historic Preservation Act Section 106 requirements, and other applicable compliance requirements.
18. All operations should follow the Georgia Best Management Practices for Forestry for environmental protection (Georgia Forestry Commission 2019).

Justification

The stipulations outlined above would ensure that the use as described is compatible with the purposes of Harris Neck NWR and would not conflict with the national policy to maintain the refuges' biological diversity, integrity, and environmental health. Based on available science and best professional judgment, the Service has determined that the commercial tree harvesting, 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 purposes of the refuges. Commercial tree harvesting could be used to manage, maintain, and restore fish and wildlife habitats.

Signature of Determination

Refuge Manager Signature and Date

Signature of Concurrence

Assistant Regional Director Signature and Date

Mandatory Reevaluation Date

2034

Literature Cited/References

Anderson, L. G., S. Roccliffe, N. R. Haddaway, and A. M. Dunn. 2015. The role of tourism and recreation in the spread of non-native species: A systematic review and meta-analysis. *PloS ONE* 10:p.e0140833.

Burger, J. and M. Gochfeld. 1998. Effects of ecotourists on bird behavior at Loxahatchee National Wildlife Refuge, FL. *Environmental Conservation* 25:13–21.

Cahall, R., J. Hayes, and M. Betts. 2013. Will they come? Long-term response by forest birds to experimental thinning supports the “field of dreams” hypothesis. *Forest Ecology and Management* 304: 137–149.

Campbell, S. P., J. W. Witham, and M. L. Hunter. 2007. Long-term effects of group-selection timber harvesting on abundance of forest birds. *Conservation Biology* 21:1218–1229.

Davies, K. W. and R. L. Sheley. 2007. A conceptual framework for preventing the spatial dispersal of invasive plants. *Weed Science* 55:178–184.

deMaynadier, P.G. and M. L. Hunter Jr. 1995. The relationship between forest management and amphibian ecology: A review of the North American literature. *Environmental Review* 3:230–261.

- Eiswerth, M. E., T. D. Darden, W. S. Johnson, J. Agapoff, and T. R. Harris. 2005. Input-output modeling, outdoor recreation, and the economic impacts of weeds. *Weed Science* 53:130–137.
- Florida Fish and Wildlife Conservation Commission. 2024. *Tricolored Bat (Perimyotis subflavus)*. <https://myfwc.com/conservation/you- conserve/wildlife/bats/field-guide/tricolored-bat>
- Georgia Forestry Commission. 2019. *Georgia's best management practices for forestry. Water Quality Program*. Georgia Forestry Commission. 84 pp. <https://gatrees.org/wp-content/uploads/2020/02/BMP-Manual-2019-Web.pdf>
- Helfrich, L. A., D. L. Weigmann, and R. J. Neves. 1998. *Landowner's guide to managing streams in the Eastern United States*. Virginia Cooperative Extension, Blacksburg, VA.
- Holmes, S. B. and D. G. Pitt. 2007. Response of bird communities to selection harvesting in a northern tolerant hardwood forest. *Forest Ecology and Management* 238:280–292.
- Marion, J. L., Y. F. Leung, and S. K. Nepal. 2006. Monitoring trail conditions: New methodological considerations. *The George Wright Forum* 23:36–49.
- Martín, B., S. Delgado, A. de la Cruz, S. Tirado, and M. Ferrer. 2015. Effects of human presence on the long-term trends of migrant and resident shorebirds: Evidence of local population declines. *Animal Conservation* 18:73–81.
- Nichols, M. T., R. Lemin Jr., and W. D. Ostrofsky. 1994. The impact of two harvesting systems on residual stems in a partially cut stand of northern hardwoods. *Canadian Journal of Forest Research* 24:350–357.
- Scheller, R. and D. Mladenoff. 2004. A forest growth and biomass module for a landscape simulation model, LANDIS: Design, validation, and application. *Ecological Modelling* 180:211–229. 10.1016/j.ecolmodel.2004.01.022
- Seymour, R. S., A. S. White, and P. G. deMaynadier. 2002. Natural disturbance regimes in northeastern North America—evaluating silvicultural systems using natural scales and frequencies. *Forest Ecology and Management* 155:357–367.

- Siitonen, J. 2001. Forest management, coarse woody debris and saproxylic organisms: Fennoscandian boreal forests as an example. *Ecological Bulletins* 49:11–41.
- Thomas, K., R. G. Kvitek, and C. Bretz. 2003. Effects of human activity on the foraging behavior of sanderlings *Calidris alba*. *Biological Conservation* 109:67–71.
- U.S. Fish and Wildlife Service (USFWS). 2024a. *Scope of work: Hazard fuel reduction and invasive species control project (2024-2026)*. Savannah Coastal Refuges Complex. 16pp.
- U.S. Fish and Wildlife Service (USFWS). 2024b. *Draft Intra-service Section 7 biological evaluation for hazard fuel reduction and invasive species control project – Savannah Coastal Refuges Complex BIL*. Savannah Coastal Refuges Complex. 14pp.
- Wiest, R. L. 1998. *A landowner's guide to building forest access roads*. U.S. Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry, Radnor, PA. 56 pp.
<https://www.landcan.org/pdfs/accessroads.pdf>
- Yasue, M. 2005. The effects of human presence, flock size and prey density on shorebird foraging rates. *Journal of Ethology* 23:199–204.