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Health Inspection
Service**

Asian Longhorned Beetle Program in Charleston, Dorchester and Colleton Counties, South Carolina

Draft Environmental Assessment - August 2020

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I. Introduction

A. Background

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), in cooperation with the South Carolina's Clemson University Department of Plant Industry (DPI), is considering actions to eradicate the invasive Asian longhorned beetle (ALB) (*Anoplophora glabripennis* (Motchulsky) (Coleoptera: Cerambycidae)). On May 29, 2020, a homeowner in Hollywood (Charleston County), South Carolina contacted DPI to report a suspect ALB. On that same day, DPI tentatively identified the insect as ALB. On June 4, USDA APHIS' National Identification Services confirmed the specimen as ALB.

As of August 15, 2020, USDA APHIS has detected ALB in 1,641 trees out of 4,827 trees inspected in Charleston County (Figure 2). USDA APHIS continues to conduct delimiting surveys to determine the extent of the infestation.

To date, in the United States there have been ALB outbreaks in five states including Illinois, Massachusetts, New Jersey, New York, and Ohio. USDA APHIS, in collaboration with its state partners, eradicated ALB from Illinois and New Jersey as well as parts of Ohio, Massachusetts, and New York (USDA APHIS 2020). ALB eradication programs are ongoing in areas of Massachusetts, New York, and Ohio.

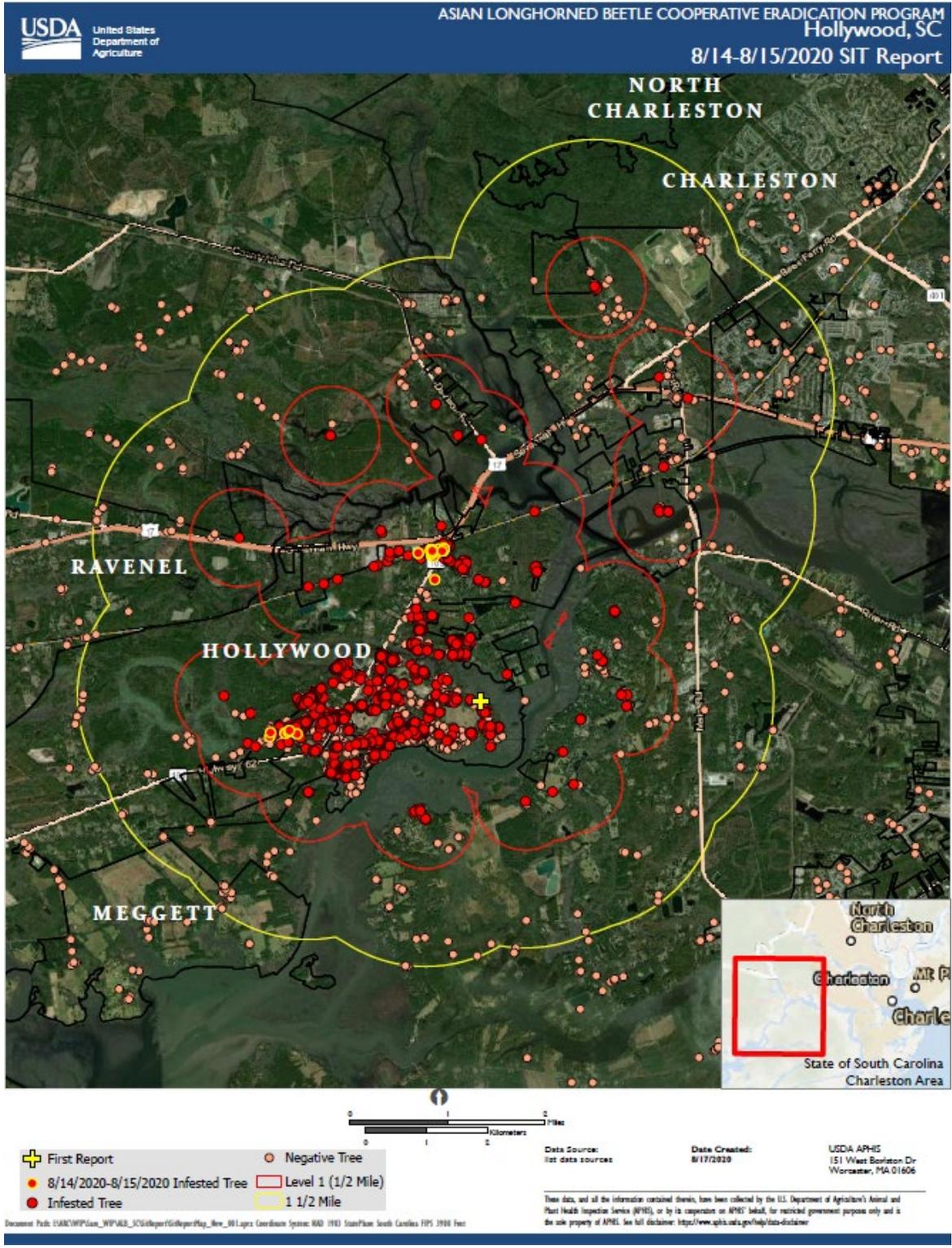
The ALB is a large, shiny black beetle with white markings on the body and antennae (Figure 1). Adult females lay eggs on the bark of host trees. Within two weeks, the eggs hatch and the small white larvae feed on the vascular tissue of the tree and eventually bore into the tree. The larvae form tunnels (or galleries) in the trunk and branches. ALB pupates inside the tree and adults emerge by chewing their way out of the tree, forming characteristic round exit holes approximately 3/8 inch in diameter. The damage from larvae burrowing into the tree and adults burrowing out of the tree cuts off nutrient flow and weaken the tree. The tree will eventually die if the infestation is severe enough. Sawdust-like or thin wood shaving debris and insect waste (called frass) from the insect's burrowing activity may be found at the base of infested trees. Infested trees are also prone to secondary attack by disease and other insects. In most



Figure 1. Adult Asian longhorned beetle.

locations, ALB produces one generation per year; however, in other countries where the pest is established, the number of annual generations varies with climate and latitude.

Figure 2. Current known ALB infested area in South Carolina as of August 15, 2020.



B. Purpose and Need

USDA APHIS has the responsibility to take actions that exclude, eradicate, and control plant pests under the Plant Protection Act of 2000 (7 United States Code (U.S.C.) 7701 et seq.). The purpose of the ALB program is to work cooperatively with the DPI to detect and eradicate ALB. Due to the potential effects of ALB to several species of hardwood trees, USDA APHIS and the DPI need to be able to detect and eradicate ALB to prevent further spread in South Carolina and spread from South Carolina into other regions of the United States.

South Carolina established the State Crop Pest Commission and delegated the commission the authority under Title 46 – Agriculture, Chapter 9, to enforce regulations that “may be necessary to eradicate or prevent the introduction, spread, or dissemination of plant pests [...]” and set quarantines (South Carolina Legislature 2020). The DPI carries out the pest management activities.

Quarantine is part of each alternative in this environmental assessment (EA), including the no action alternative (described below). Federal quarantine authority for ALB includes 7 CFR § 301.51 for eradication programs, 7 CFR § 319.40 for solid wood packing material, and 7 CFR § 330 for plant pests. Under these regulations, USDA APHIS establishes quarantines and regulates international and interstate movement of regulated plant host material, also referred to as regulated articles. USDA APHIS cannot regulate intrastate movement without the State Plant Regulatory Agency first establishing an intrastate quarantine. Intrastate quarantine facilitates regulatory activities within a geographical area less than an entire State. USDA APHIS and State plant regulatory agencies establish quarantine boundaries 1.5 miles from a tree with ALB-exit holes, and 0.5 miles from a tree with egg sites only. Under quarantine, USDA APHIS restricts the movement of regulated articles, which present a risk of spreading ALB interstate from the quarantine area. The regulated articles listed under the quarantine 7 CFR § 301.51 (last accessed 6/23/2020) include firewood (all hardwood species, not restricted to ALB-host trees); green lumber, and other living, dead, cut, or fallen material, including nursery stock, logs, stumps, roots, branches, and debris from ALB-host trees of ½ inch or more in diameter. There are 12 genera of host trees that USDA APHIS regulates for ALB and are considered at-risk hosts: *Acer* (maple and box elder), *Aesculus* (horse chestnut and buckeye), *Albizia* (mimosa), *Betula* (birch), *Cercidiphyllum* (katsura tree), *Fraxinus* (ash), *Koelreuteria* (golden raintree), *Platanus* (sycamore and London planetree), *Populus* (poplar), *Salix* (willow), *Sorbus* (mountain ash), and *Ulmus* (elm) (7 CFR § 301.51–2, last accessed 6/23/2020). The Program has found ALB egg sites and two larval entrance/exit holes on one *Nyssa biflora* (swamp tupelo) tree in Charleston County. *Nyssa* spp. are not confirmed hosts for ALB. The Program is conducting research on this find and will continue to monitor *Nyssa* spp. for ALB activity.

This EA considers ALB detection and eradication efforts in Charleston, Dorchester, and Colleton counties in South Carolina wherever ALB is detected. Currently, ALB is not known to occur in Dorchester and Colleton counties, but the USDA APHIS includes these counties in this EA due to their proximity to Charleston County and on its experience with ALB outbreaks elsewhere in the United States.

This EA was prepared consistent with the National Environmental Policy Act of 1969 (NEPA) and the USDA APHIS NEPA implementing procedures (7 Code of Federal Regulations (CFR) part 372) for the purpose of evaluating how the proposed action, if implemented, may affect the quality of the human environment.

In September 2015, the USDA APHIS published a programmatic environmental impact statement (EIS) for the ALB eradication program (USDA APHIS 2015, <https://www.regulations.gov/docket?D=APHIS-2013-0003>). The programmatic EIS considers the impacts eradication efforts have on nontarget species, human health, and the environment. This EA tiers to that programmatic EIS. USDA APHIS posts site-specific environmental assessments for the ALB eradication program on the USDA APHIS ALB webpage at <https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/asian-longhorned-beetle>.

C. Outreach

In June 2020, USDA APHIS contacted residents in the outbreak area by going door-to-door in person and by email sent through homeowner association email distribution lists informing them of the infestation and the surveys, tree inspections, yard waste and tree markings. USDA APHIS also attended one homeowner association's annual meeting and met with the mayor of Hollywood, South Carolina to discuss the ALB outbreak.

On June 15, USDA APHIS sent a notice to stakeholders and DPI published a news release about the outbreak and the surveys taking place. USDA APHIS and DPI met with the Coastal Conservation League to discuss potential cooperative outreach efforts. USDA APHIS and DPI placed outreach materials in several community locations including local grocery stores, community centers, and town offices in Hollywood, Meggett, Ravenel, and Johns Island. USDA APHIS and DPI contacted higher-risk and green industry businesses in the Hollywood/Ravenel/Johns Island area to inform them of the ALB infestation. The businesses included 67 landscape/arborist companies, 15 stone/heavy equipment companies and campgrounds, and 8 garden centers.

USDA APHIS and DPI met with the Charleston County Park and Recreation Commission staff at an ALB-infested site in the Stono River County Park to show what an ALB infestation looks

like and to describe the ALB Program eradication methods being used in other ALB outbreaks in the United States. On a separate occasion, USDA APHIS, DPI, and Clemson University Extension met with several arborists and green industry professionals at the Stono River County Park and gave them a similar overview. USDA APHIS and DPI met with the SC Department of Agriculture staff to provide outreach and to show ALB damage in the field. Clemson University met with a representative from the SC Forestry Commission to provide outreach and show ALB damage in the field. USDA APHIS will continue to conduct outreach activities about ALB and the Program.

II. Alternatives

NEPA regulations (40 CFR §§ 1508.25) require the scope of analysis to include a no action alternative in comparison to other reasonable courses of action.

A. No Action Alternative

Under the no action alternative, USDA APHIS would not assist in the eradication of ALB in Charleston, Dorchester, and Colleton counties, South Carolina. Other Federal and non-federal government agencies and private landowners may work to eradicate ALB; however, there would be no cooperative or coordinated efforts among USDA APHIS and other stakeholders. USDA APHIS could conduct surveys to determine the extent of an infestation and implement quarantine restrictions where ALB infestations occur.

ALB detection is by visual observation. Inspectors look for exit holes, egg-laying sites, frass, tunneling, and sap flow from damaged sites. Inspectors search for signs using binoculars from the ground and may conduct aerial tree inspections through trained professionals using bucket trucks to peer into trees from above, and by trained tree climbers to search for signs of an infestation within tree canopies.

ALB program inspectors conduct surveys to (1) determine the scope of the infestation; (2) establish the quarantine area; (3) determine that ALB has not spread outside of the established quarantine area and, if it has, to expand the quarantine area; and (4) determine when to release an area from quarantine. The Program's survey areas may include residential, commercial, and public land; access to these properties is necessary for the Program. The programmatic EIS provides details of the surveys, which are summarized here.

The Program follows two levels of survey. During the level 1 survey, inspectors visually look for signs of infestation on every regulated host tree and *Nyssa* spp. in a circular radius around the infestation, until they fail to find ALB within approximately a ½-mile radius of infested trees. If inspectors find additional infestations, APHIS extends the ½-mile radius from the outermost

find. The level 2 survey is a safeguard to ensure that ALB is not spreading beyond the ½-mile radius around infested host trees established during the level 1 survey. During the level 2 survey, also known as a buffer survey, inspectors survey host trees within a minimum of one mile beyond the survey boundary set during the level 1 survey. This results in approximately a 1½-mile radius from the point of infestation for trees with less than 100 exit holes. The Program expands the level 2 survey to a minimum of 2.5 miles from areas that are or were centers of high ALB populations, as denoted by the presence of a cluster of trees with many exit holes or one or more trees with >100 exit holes. The ALB program may conduct a level 3 survey, also called a high-risk site survey. This survey extends beyond established survey boundaries to inspect high-risk sites, as described in the programmatic EIS. To lift an area from quarantine, an area must return a negative survey, as described in the programmatic EIS.

B. Preferred Alternative

Under the preferred alternative, USDA APHIS proposes activities to detect and eradicate ALB throughout Charleston, Dorchester, and Colleton Counties in South Carolina wherever it is found. USDA APHIS would conduct surveys as described under the no action alternative above and in the programmatic EIS.

In upland or dryland areas, the Program would remove and chip or incinerate infested trees to destroy ALB that may be within those trees, thus eliminating potential adult beetle emergence, dispersal, and mating. The Program chips trees in place or takes the tree to an approved facility for chipping. The Program may also remove or treat with imidacloprid non-infested ALB high-risk host trees that are within a ½-mile radius of infested trees. High-risk host trees are those that belong to the 12 genera of trees that are preferred hosts of ALB and that the USDA APHIS regulates. The Program may include *Nyssa* spp. on the list of high-risk host trees due its recent find of eggs sites and two larval holes on *Nyssa biflora*. Applications of imidacloprid are through trunk or soil injection, according to product label requirements. Soil injection of imidacloprid is rarely, if ever used. See the programmatic EIS for additional information on tree removal and treatment.

After removing trees, the Program would either grind tree stumps or apply herbicide to tree stumps to prevent regrowth of the tree and potential reinfestation. The Program uses the herbicides triclopyr or triclopyr mixed with imazapyr and metsulfuron-methyl. Herbicide applications are through foliar applications to sprouting foliage or painting the root collar area, the sides of the stump, and the cut surface. In some locations, the Program may leave stumps and allow regrowth, particularly in areas prone to soil erosion or sensitive wildlife habitats. The programmatic EIS provides additional information on tree removal and insecticide and herbicide applications. After removing trees, the Program restores the area through grading and planting groundcover consistent with the area where removals took place. This reduces the opportunity

for invasive weeds to become established and provides a groundcover that will help hold soil in place. In woodlot settings a seedbank already exists and planting groundcover may be unnecessary.

Removal or imidacloprid treatments of high-risk host trees and *Nyssa* spp. would be conducted only with permission from the landowner. If the landowner does not allow removal or imidacloprid treatment of select high-risk host trees, the Program will continue to survey host trees for presence of ALB. However, if the trees become infested, the Program will remove them.

In wetland areas where the infested area is approximately 3 acres or less in size, the Program would likely remove infested and high-risk host trees, which may include *Nyssa* spp., and move the tree debris to an offsite facility for chipping or incineration. The Program imposes this size limitation based on its experience in eradicating ALB from small wetland areas in the Northeastern United States. The Program would make herbicide treatments to tree stumps and sprouting foliage, following the herbicide label instructions. The Program would not treat high-risk host trees with imidacloprid in wetland areas.

In wetland areas where the infested area is 3-acres or greater in size, the Program may girdle infested and high-risk host trees, which may include *Nyssa* spp. to kill the trees. At this time, the Program would not remove infested and high-risk host trees (or *Nyssa* spp.) or treat trees with imidacloprid. An exception to not removing trees is when an infested tree poses a risk to the public. The program may use herbicides to treat the trees below the area of girdling. The Program would only girdle trees in areas not accessible by the public due to tree-fall safety hazards. The Program is researching eradication methods in large wetland environments that minimize impacts to non-target terrestrial and aquatic species and that are cost-effective. Appendix 2 provides maps of forested wetland areas near the ALB outbreak.

The proposed ALB eradication program is an adaptive management program that is based on the pest response guidelines for ALB (USDA APHIS 2014). The ALB program will identify areas and host genera for either chemical and/or removal of high-risk host trees. Subject areas will be identified based on levels of infestation, host tree density and distribution, potential environmental impacts, and financial resources. This provides the most flexibility in selecting an appropriate control method for a location. It is also the most cost-effective method because this alternative does not prescribe that all high-risk host trees must be treated or removed; rather, it allows flexibility in focusing treatments on the high-risk host genera most preferred by ALB (i.e., *Acer*, etc.) or certain locations that would be higher risk than others. High-risk locations include, but are not limited to:

- Landscape and nursery businesses
- Tree and lawn care companies

- Firewood producers and transporters
- State and local parks/forestry departments
- Local utility and sanitation services
- Parks and campsites
- Landfills and disposal sites
- Import facilities that receive or have received high-risk cargo from known source countries
- Stone dealers or stone cutting facilities, such as monument/headstone companies, near infestations because of the use of wood packing material to ship and store the stone

III. Potential Environmental Consequences

The sections below consider the potential environmental consequences under the no action and preferred alternative by summarizing information associated with the physical environment, biological resources (including nontarget species), human health and safety, socioeconomics, environmental justice, Tribal consultation, and any potential historic and cultural resources. The no action alternative presents a description of the environmental baseline, the current situation, for each environmental resource analyzed, followed by an analysis of the potential environmental impacts of the preferred alternative to those resources. The potential impacts may be direct, indirect, or cumulative, and of short or long duration. The impacts may also be either beneficial or adverse.

A. No Action Alternative

The affected environment covers the counties of Charleston, Dorchester, and Colleton in South Carolina. Under the no action alternative, USDA APHIS may conduct surveys and establish quarantines, but would not assist in the eradication of ALB. Other Federal and non-federal government agencies and private landowners may work to eradicate ALB; however, there will be no cooperative or coordinated efforts among USDA APHIS and other stakeholders.

Quarantine will reduce human mediated spread but does not prevent the natural spread of ALB. Not eradicating ALB will lead to the beetle infesting additional trees and its expansion into other non-infested areas of the three counties under consideration, and likely other counties in the state and locations elsewhere in the region. Given the known global distribution of ALB, the insect is probably capable of surviving anywhere in the United States where suitable host plants and climatic conditions are favorable. Without USDA APHIS participation in eradication, ALB will spread and infest more trees when compared to the preferred alternative. Because of this, ALB may impact every resource evaluated below to a greater extent than the preferred alternative due to the possibility of more trees becoming infested.

Twelve tree genera are regulated hosts for ALB: *Acer* (maple and box elder), *Aesculus* (horse chestnut and buckeye), *Albizia* (mimosa), *Betula* (birch), *Cercidiphyllum* (katsura tree), *Fraxinus* (ash), *Koelreuteria* (golden raintree), *Platanus* (sycamore and London planetree), *Populus* (poplar), *Salix* (willow), *Sorbus* (mountain ash), and *Ulmus* (elm). These species are not dominant species in these three counties; dominant species are coniferous trees with other hardwood trees such as oak (*Quercus*), yellow poplar (*Lirodendron*), and walnut (*Juglans*) (Figure 3; Appendix 1). The Program may include *N. biflora* to the list of regulated hosts if it confirms ALB can complete its lifecycle on this tree. The Program found egg sites and two larval entrance/exit holes on one *N. biflora* tree. ALB host species may be planted as ornamental and urban shade trees. Green spaces in these counties encompass city and county parks, and State and Federally managed lands and parks. For example, Charleston County has numerous parks, such as the Stono River County Park and Meggett County Park. The Audubon's Francis Beidler Forest falls within Dorchester County.

The Francis Marion National Forest falls within Charleston County and is comprised of the following forest-type groups: longleaf-slash pine, loblolly-shortleaf pine (the primary forest type), oak-pine, oak-hickory, and oak-gum-cypress (Oswalt 2005). Although these forest-type groups do not include one of the 12 genera of ALB host trees, it does not mean host trees are absent from the Francis Marion National Forest.

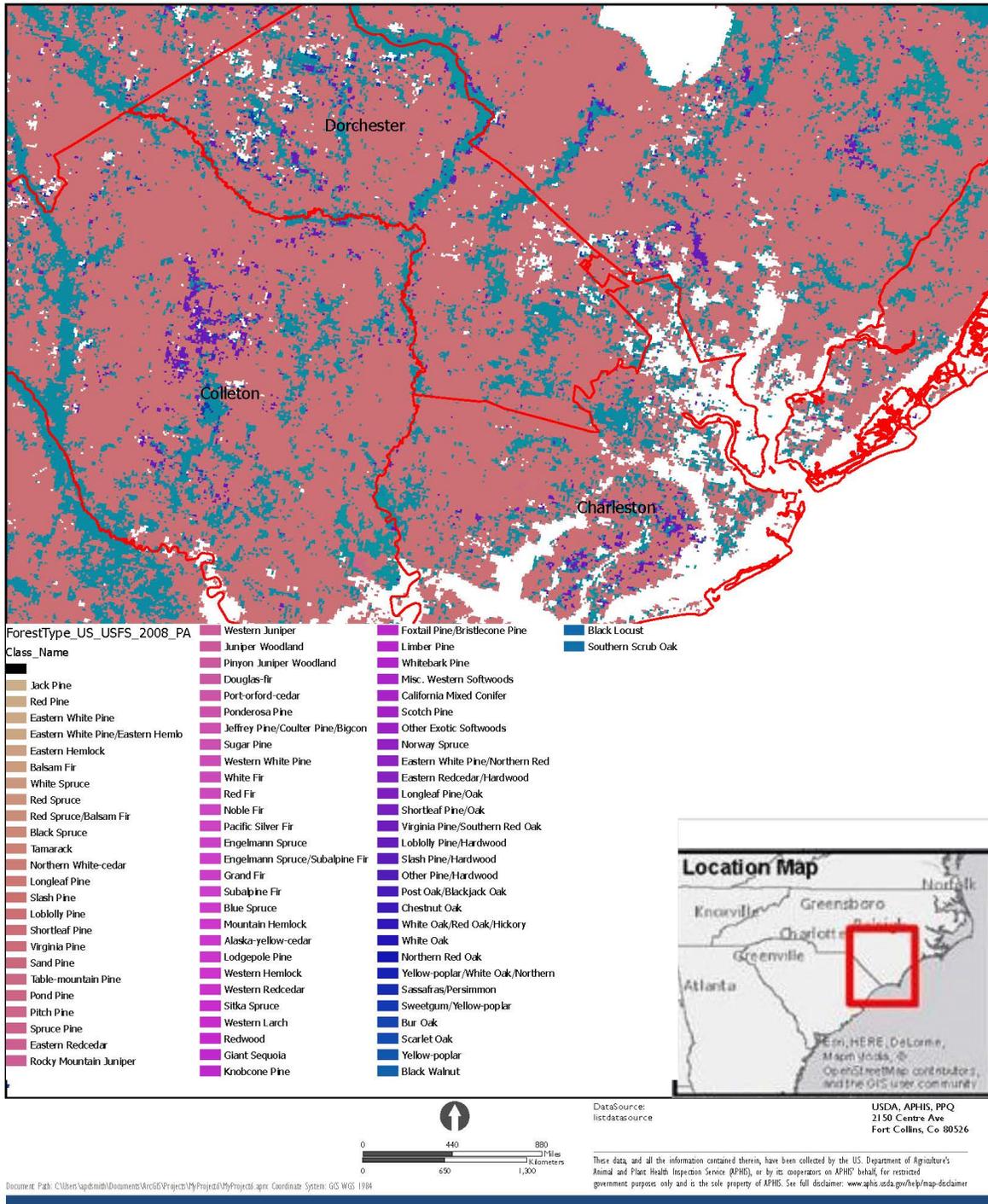


Figure 3. Forest type cover for Charleston, Colleton, and Dorchester Counties, South Carolina (USDA FS 2008)

1. Physical Environment

Air

Trees intercept pollutants from the air, reducing human exposure and associated risks, such as respiratory illnesses (Beckett et al. 1998, Bell and Treshow 2002, Donovan et al. 2013, Kim and Bernstein 2009, Lovasi et al. 2008, Nowak et al. 2000, Nowak et al. 2006, Tiwary et al. 2009). Trees, including ALB-host trees, store carbon and play a role in the reduction of carbon dioxide (CO₂) in the atmosphere, a gas that contributes to greenhouse gas levels.

The U.S. Environmental Protection Agency (USEPA) uses Air Quality Index (AQI) values to indicate overall air quality. AQI takes into account all the air pollutants measured within a geographic area. In 2019, Charleston County reported one day where the AQI was considered unhealthy for sensitive groups (USEPA 2019). In Colleton County, no days were reported as unhealthy. Data for 2019 was unavailable for Dorchester County. Air quality data for South Carolina and other States are located at <https://www.epa.gov/outdoor-air-quality-data/air-quality-index-report>.

The Clean Air Act (CAA) is the primary Federal law that protects the Nation's air quality for the purposes of public health and welfare. The CAA requires the USEPA to establish National Ambient Air Quality Standards (NAAQS) for specific pollutants. These pollutants are known as criteria pollutants, and they include ozone, particulate matter, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide (SO₂), and lead. The NAAQS are intended to represent the maximum concentration of a particular pollutant in the ambient air that will not adversely impact public health or welfare. Charleston, Colleton, and Dorchester Counties meet NAAQS attainment standards (SCDHEC 2020b, USEPA 2020).

The loss of trees to ALB reduces carbon sequestration, and the decomposition of dead trees release CO₂ into the atmosphere. The loss of trees from ALB would cause a reduction in the interception of air pollutants and other air quality improvements; however, through natural succession or replanting with non-host trees, the air quality contributions would recover over time.

Other Federal and non-federal agencies and private landowners may choose to remove infested trees. Although the vehicles and machinery used during tree removal contribute particulates and other pollutants, these are not expected to contribute a significant amount compared to other vehicle and machinery usage in the area. Felled trees and tree debris may be chipped or incinerated. Incineration of ALB host material would increase temporarily air pollution particulates in the vicinity.

The no action alternative is not expected to have any long-term or permanent impacts to air quality standards and greenhouse emissions or CO₂ sequestration in these three counties because ALB host trees are not dominant tree species (Figure 3; Appendix 1) and we expect some tree replacement with non-host species to occur. The programmatic EIS provides additional details on the interaction of trees and air quality and greenhouse gas emissions in the context of ALB infestations.

Water

The Clean Water Act, the Safe Drinking Water Act, and the Water Quality Act are the primary Federal laws protecting the Nation's waters. Federal activities also must seek to avoid or mitigate actions that will adversely affect areas immediately adjacent to wild and scenic rivers (National Wild and Scenic Rivers Act of 1968, as amended (16 U.S.C. §§ 1271-1287)). The 41.9 miles of river in South Carolina designated as a Federal wild and scenic river do not pass through the three counties covered in this EA (WSR 2020).

Polluted runoff, known as nonpoint source pollution, occurs when rainfall picks up contaminants such as insecticides, sediment, nutrients, or bacteria on its way to lakes, rivers, wetlands, coastal waters, and ground water. Nonpoint source pollution occurs from activities such as fertilizing a lawn, road construction, pet waste, and improperly managed livestock, crop, and forest lands. Today, States report that nonpoint source pollution is the leading cause of water quality problems (USEPA 2018). In South Carolina, the primary indicators for water impairment in rivers and streams were pathogens, organic enrichment/oxygen depletion, impaired biota, pH, various metals, turbidity and other impairments (USEPA 2012). Waterbodies that are impaired and do not meet water quality standards are listed under 303(d) of the Clean Water Act. Charleston, Colleton, and Dorchester Counties report 303(d) listed waters (SCDHEC 2020a).

The no action alternative is not expected to result in significant impacts to water quality standards in South Carolina. The spread of ALB would likely result in other government agencies, as well as private landowners, making insecticide treatments for suspected ALB. Increased pesticide use would be expected to be minor relative to other registered uses but could result in increased risk to water quality, in particular under misuse. Removal of trees near a water resource could cause sedimentation and the reduced shade cover could cause stream temperature changes. However, these impacts will be localized and replacement vegetation would reduce sedimentation.

Soil

Soil health or soil quality is the ability of soil to function as a vital ecosystem, sustaining plants, animals, and humans (USDA NRCS 2020b). Soil is an ecosystem that provides nutrients for

plant growth, absorbs and holds rainwater, filters and buffers potential pollutants, serves as a foundation for agricultural activities, and provides habitat for soil microbes to flourish (USDA NRCS 2020b). It is important to manage soils so they are sustainable for future generations.

South Carolina has a diverse range of soil types due to variations in climate and shifting of the shoreline from glaciation (Cooke 1936). USDA-NRCS provides detailed information regarding the types of soil found in the three counties and the characteristics of the various soil orders in South Carolina (USDA NRCS 2020a, USDA NRCS 2020c)

USDA APHIS considers impacts from the no action alternative to soil resources as significant if activities result in substantially increased erosion and sedimentation or adversely affect unique soil conditions. Tree removal does disturb soil; equipment can compact the soil and stump removal can cause soil erosion. Therefore, the removal of infested trees that may occur under this alternative may affect soil quality; however, the effects are likely to be localized. The likely spread of ALB under the no action alternative would result in additional infested trees that would require removal especially in situations where they may pose hazards to the public.

The spread of ALB would likely result in other government agencies, as well as private landowners, making insecticide treatments for suspected ALB. Increased pesticide use would be expected to be minor relative to other registered uses but could result in increased risk to soil quality by harming soil-inhabiting insects, in particular under misuse.

2. Biological Resources

Biological resources include plant and animal species and the habitats where they live. For this EA, biological resources will focus on plants, wildlife, and protected species. The plant and wildlife subsections include both native and non-native species. Protected species refers to bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA), migratory birds protected under the Migratory Bird Treaty Act of 1918 (MBTA), as amended, and threatened and endangered species and their critical habitats as protected under the Endangered Species Act (ESA).

Vegetation

Under the no action alternative, the presence of ALB is not expected to have significant direct effects to aquatic plants. Although trees that are hosts to ALB grow naturally or are planted in Charleston, Colleton, and Dorchester County, coniferous trees and other non-host hardwood trees are dominant tree types (Figure 3, Appendix 1). Hosts for ALB include *Acer* (maple and box elder), *Aesculus* (horse chestnut and buckeye), *Albizia* (mimosa), *Betula* (birch), *Cercidiphyllum* (katsura tree), *Fraxinus* (ash), *Koelreuteria* (golden raintree), *Platanus*

(sycamore and London planetree), *Populus* (poplar), *Salix* (willow), *Sorbus* (mountain ash), and *Ulmus* (elm). The Program found egg sites and two larval entrance/exit holes on *N. biflora*; the Program is researching if ALB can complete its lifecycle on this tree. Other terrestrial plant species are not expected to be significantly impacted by the presence of ALB. Under the no action alternative, we expect the beetle to expand its distribution and infest a greater number of trees compared to the preferred alternative. The removal of trees could affect understory vegetation directly through disturbance and indirectly through a reduction in shade. Insecticide treatments are unlikely to harm vegetation, including those plant species reliant on insect pollinators. It is possible other Federal and non-federal agencies and private landowners would use herbicides to prevent tree stumps from sprouting. Herbicide applications may harm vegetation nearby through runoff or drift. Label instructions and requirements will reduce the exposure to nearby plants.

Wildlife

The diversity of ecosystems in Charleston, Dorchester and Colleton Counties support a variety of aquatic and terrestrial wildlife. Freshwater and marine ecosystems are not expected to be impacted by the presence of ALB based on the life history requirements for ALB. Impacts to terrestrial wildlife will depend on whether native wildlife species depend on host trees for food or shelter. The death of host trees in the three counties to ALB and the removal of host trees may have a localized impact to wildlife. Impacts to wildlife due to tree removal and loss of host trees would increase as ALB expands its range within the State and other regions under the no action alternative.

The use of insecticides to manage for ALB and herbicides to prevent stumps from sprouting could affect wildlife, depending on the product used and the way it is applied. The programmatic EIS summarizes toxicity information for the insecticide imidacloprid and the herbicides triclopyr and triclopyr mixed with imazapyr and metsulfuron-methyl based on the Program's proposed use pattern. It is possible that other Federal and non-federal agencies and private landowners use pesticides other than the four the Program proposes to use and these will have their own toxicity and exposure risks. The use of pesticides would be expected to increase under the no action alternative since ALB would be expected to spread resulting in attempts to protect trees using various insecticides, or using herbicides to treat stumps and vegetation that could serve as ALB host material. The increased use of pesticides over larger areas as a result of ALB expansion would increase risk to nontarget wildlife.

Charleston, Colleton, and Dorchester counties have several species that are categorized as state endangered, threatened, sensitive, or are candidates for state-listing (SCDNR 2020a). Many of these species are also protected under the ESA.

(1) *Migratory Bird Treaty Act*

Federal law prohibits an individual to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird or any part, nest, or egg of any such bird (16 U.S.C. §§ 703-712; 50 CFR § 21). Birds that nest or forage in ALB host trees could be impacted if the trees become infested with ALB and die or are removed. Other Federal and non-federal agencies, as well as private landowners, may use insecticides to treat for ALB or remove ALB infested trees.

(2) *Bald and Golden Eagle Protection Act*

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c) prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. During their breeding season, bald eagles are sensitive to a variety of human activities. Bald eagles nest in Charleston, Colleton, and Dorchester counties, South Carolina (SCDNR 2020b). South Carolina is in the non-breeding, scarce range for the golden eagle (The Cornell Lab 2020). There are reports of golden eagles in Charleston County (The Cornell Lab 2020). Bald eagles and golden eagles would not be impacted by the presence of ALB due to habitat and dietary preferences of eagles. Although bald eagles nest in forested areas, the death or removal of ALB host trees would not alter the eagle’s habitat, as there are other non-host trees and ALB host trees are not typically used for nesting. It is possible the sounds from tree removal would disturb the eagles, but this disturbance would be of short duration.

(3) *Endangered Species Act*

Section 7 of the ESA and ESA’s implementing regulations require Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered (T&E) species, or result in the destruction or adverse modification of critical habitat. The following T&E species or their critical habitats occur in at least one of the counties: American chaffseed (*Schwalbea americana*); Bachman’s warbler (*Vermivora bachmanii*); Canby’s dropwort (*Oxyops canbyi*); eastern black rail (*Laterallus jamaicensis ssp. jamaicensis*); frosted flatwood salamander (*Ambystoma cingulatum*); green sea (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp’s ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and loggerhead (*Caretta caretta*) sea turtles; northern long-eared bat (*Myotis septentrionalis*); piping plover (*Charadrius melodus*); pondberry (*Lindera melissifolia*); red-cockaded woodpecker (*Picoides (=Dendrocopos) borealis*); red knot (*Calidris canutus rufa*); seabeach amaranth (*Amaranthus pumilus*), West Indian manatee (*Trichechus manatus latirostris*) and the wood stork (*Mycteria americana*).

3. Human Health and Safety

Under the no action alternative, potential human health impacts are related to the activities other Federal and non-federal agencies and private landowners take to manage ALB. The spread of ALB would likely result in these parties making insecticide treatments for suspected ALB on their property, as well as removing infested trees or trees that died from ALB infestation. Increased pesticide use would be expected to be minor but would result in some increase in exposure and risk to human health. The potential of more trees becoming infested under this alternative may increase the risk of tree-falling hazards, such as when limbs or whole trees fall on power lines, cars, houses, or people.

4. Socioeconomic

Municipalities and property owners that lose trees to ALB may have costs associated with their removal and replacement. The loss of trees, particularly clusters of trees or mature trees, changes the landscape and can have aesthetic impacts.

Forestry is an important industry in South Carolina. In 2014, forestry ranked first in manufacturing industry jobs and the forestry industry accounted for \$17 billion annually (SCFC 2014). Hardwood trees cover approximately 53% of the forestland in the state (SCFC 2014). In 2016, the forest-type group makeup of timberland in the state was oak-hickory (22%), Oak-gum-cypress (15%), Oak-pine (12%), elm-ash-cottonwood (3%), longleaf-slash pine (4%) and loblolly-shortleaf pine (44%) (Brandeis et al. 2017). In Charleston, Colleton, and Dorchester counties, coniferous trees comprise the majority of the tree canopy (Figure 3, Appendix 1); ALB host trees are not a prominent tree type. The commercial forestry industry in these three counties may feel some impacts from the loss of ALB host trees even if they are not dominant species. Forest product mills located in the three counties may experience some loss due to quarantine restrictions imposed on the movement of ALB host material. It is possible that lightly infested trees could have salvageable wood timber and other end-use products; however, the quarantine does not allow the diversion of infested trees from chipping to saw mills because of the risk of spreading ALB.

In South Carolina, ecosystem services such as carbon-sequestration credits and markets, natural forest processes such as water quality and quantity, and recreational activities have existing markets with the potential to grow (SCFC 2010). The loss of trees to ALB will have localized impacts to ecosystem services, but significant impacts are not expected unless ALB expands its current distribution in South Carolina and the region.

5. Environmental Justice

Federal agencies identify and address disproportionately high and adverse human health or environmental impacts of proposed activities, as described in Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. Federal agencies also comply with EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO requires each Federal agency, consistent with its mission, to identify and assess environmental health and safety risks that may disproportionately affect children and to ensure its policies, programs, activities, and standards address the potential for disproportionate risks to children.

USDA APHIS has considered the potential environmental impacts of implementing the no action alternative on minority and/or low-income communities. The impacts would be similar to those described under the human health and safety section of the no action alternative.

6. Tribal Consultation and Coordination

Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments," calls for agency communication and collaboration with Tribal officials for proposed Federal actions with potential Tribal implications. The Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-mm), secures the protection of archaeological resources and sites on public and Tribal lands. No Federally-recognized Tribes have been identified in the Counties of Charleston, Colleton, and Dorchester. Consultation with local Tribal representatives occurs prior to the onset of program activities to inform fully the Tribes of possible actions the Agency may take on or near Tribal lands. If USDA APHIS discovers any archaeological Tribal resources, it will notify the appropriate individuals. The no action alternative should not pose adverse effects to these resources.

7. Historic and Cultural Resources

The National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. §§ 470 et seq.), requires Federal agencies to consider the potential for impacts to properties included in, or eligible for inclusion in the National Register of Historic Places (36 CFR §§ 63 and 800) through consultation with interested parties where a proposed action may occur. This includes districts, buildings, structures, sites, and landscapes. A search for properties with a national register listing on the South Carolina Historic Properties Record online database (accessed August 5, 2020 at <http://schpr.sc.gov/index.php>) found 87 sites in Charleston County, 1 site in Colleton County, and 3 sites in Dorchester County (SC Department of Archives and History 2020). These properties are mostly historic buildings. The no action alternative would not pose direct adverse effects to historic buildings; however, ALB infested trees on historic properties could pose a danger to the public and removal of infested trees would alter the views of these properties.

Anticipated impacts may be a localized and temporary change in aesthetics due to the loss of trees, particularly mature trees.

B. Preferred Alternative

This section considers the potential environmental consequences for the preferred alternative by summarizing information associated with the physical environment, biological resources, human health and safety, socioeconomics, environmental justice, Tribal consultation, and historic and cultural resources. The preferred alternative is expected to further reduce the likelihood of ALB populations becoming established when compared to the no action alternative, minimizing further impacts of ALB on the environment and the public.

1. Physical Environment

USDA APHIS anticipates that the Program's use of the insecticide imidacloprid and the herbicides triclopyr and triclopyr mixed with imazapyr and metsulfuron-methyl will have minimal impacts on the physical environment, provided the Program follows the pesticide labels for each chemical. Ecological and human health risk assessments for each pesticide are available in the programmatic EIS and are summarized below.

Air

USDA APHIS does not anticipate additional impacts to air when compared to the no action alternative. No impacts to air quality are anticipated for the proposed insecticide or herbicide treatments. Drift is not anticipated based on the methods of application. The programmatic EIS provides additional information on the volatilization and drift potential of Program pesticides.

Equipment used during tree removal and chipping or girdling will cause a temporary and localized increase in pollutants but is not expected to be a significant source of particulates and other pollutants. Similarly, incineration of tree debris would cause a temporary and localized increase in particulates.

Water

USDA APHIS does not anticipate additional impacts to water when compared to the no action alternative. USDA APHIS will consider impacts from the preferred alternative to water resources as significant if they exceed Federal or State water quality standards. Tree removal may cause a temporary change in water temperature due to reduced shade and increase sedimentation. The degradation of water quality can have direct and indirect impacts to aquatic species.

Pesticides, when used improperly, can end up in surrounding water bodies. Pesticides can reach waterways from spray drift, spills, or run-off either in solution or on soil particles that are moved by hydraulic forces. Significant drift or runoff of herbicide is not expected as Program applications are not broadcast applied but are made either using a backpack sprayer to deliver a coarse droplet size, or by brushing the material on individual stumps and associated sprouting vegetation. The Program adheres to herbicide labels restrictions regarding applications in or near water resources. The Program makes imidacloprid applications using trunk or soil injection. Imidacloprid exhibits physical and chemical properties that suggest it could contaminate surface and ground water. Detections of imidacloprid in ground water have occurred in various parts of the United States, including States where ALB is present. Solubility and a lack of affinity for binding to soil or sediment suggest that imidacloprid could move offsite through runoff or leaching. The ability to leach into ground water would depend on site-specific conditions, such as soil type and depth to the water table. However, label restrictions regarding applications near surface water and other information regarding ground water reduces the potential for water contamination. In addition, the preferred use of tree injections of imidacloprid by the Program further reduces the possibility of impacts to water quality when compared to soil injection.

In wetland areas with ALB infestations 3-acres or greater in size and that are not accessible to the public, the Program would likely girdle infested and high-risk host trees, which may include *N. biflora*. The Program would leave these trees in place, which minimizes soil disturbance and sedimentation. An exception to not removing trees is when an infested tree poses a risk to the public. The Program does not expect girdling to increase impacts to water resources any greater than the no action alternative, because under the no action alternative, infested host trees in wetlands would eventually die from ALB. In the long-term, the Program expects less impact from the preferred alternative because its goal is to eradicate ALB.

Soil

USDA APHIS does not anticipate additional impacts to soil when compared to the no action. Rather, we expect less impact in the long-term since we expect eradication compared to the no action alternative where ALB is expected to spread.

USDA APHIS considers impacts from the preferred alternative to soil resources as significant if proposed activities result in substantially increased erosion and sedimentation or adversely affected soil fauna. USDA APHIS expects the preferred alternative to have impacts in the immediate vicinity during and shortly after tree removal. Equipment may cause soil compaction and some erosion may occur until vegetation grows on the site and stabilizes the soil. Surveyors and applicators may cause some local compaction when they walk across the ground, but the Program does not expect this to be significant.

In wetlands with ALB infestations greater than 3 acres in size, the Program would likely not remove infested or high-risk host trees, which may include *N. biflora*. An exception to not removing trees is when an infested tree poses a risk to the public. The Program would girdle trees that are not accessible to the public. The Program would leave these trees in place, which does not disturb the soil.

Imidacloprid injections into trees will have no impact to soil fauna. However, soil injections made at the base of the tree could affect soil fauna in the treatment location, but this impact would be localized and of short duration. Herbicide applications to tree stumps are not expected to impact soil.

2. Biological Resources

Vegetation

Similar to the no action alternative, potential impacts to vegetation other than non-host trees from the preferred alternative are expected to be minimal. The removal of trees would cause damage to vegetation in the immediate vicinity of the tree. Any removal of infested or high-risk host trees from local or State parks, as well as Federally-managed lands will be coordinated with the appropriate agencies.

The use of imidacloprid will have no impacts to surrounding vegetation. Trees treated with imidacloprid will have a small wound at the injection site but these areas on the tree are expected to heal.

The Program uses herbicides when there are limitations to the physical removal of stumps. The limitations include those areas that are inaccessible to equipment used for stump grinding, and those areas that are sensitive to erosion or compaction. The herbicides triclopyr and triclopyr mixed with imazapyr and metasulfuron-methyl could harm non-target plants. However, the Program's application methods and label directions minimize impacts to terrestrial plants, restricting potential harm to those plants that are immediately adjacent to treated stumps or sprouts. Exposure in aquatic systems is not expected to occur at levels that could result in any direct impacts to aquatic plants, or at levels that would suggest indirect impacts to aquatic organisms that depend on aquatic plants as a food source or as habitat.

The girdling of infested and high-risk host trees, which may include *N. biflora*, in wetlands with ALB infestations 3-acres or greater in size would kill these trees. The Program expects some damage to vegetation as they access these trees. The trees would not die immediately and the Program expects adult ALB to emerge from infested girdled trees. The Program also acknowledges that ALB could re-infest girdled trees and infest girdled high-risk host trees that are not dead. Tree girdling does not immediately remove ALB as with host removal. However,

until the Program develops strategies to eradicate ALB from large wetland areas, it will likely use girdling to slow the spread of ALB.

Wildlife

Impacts to wildlife from the loss of trees will be similar or slightly greater temporarily to that described in the no action alternative. The slightly greater impacts would be the result of the removal or girdling of both infested trees and high-risk host trees; however, in the long-term, the eradication of ALB will prevent its spread to unaffected areas. The programmatic EIS describes in more detail the impacts of tree removal on wildlife.

Actions associated with the preferred alternative will temporarily increase the presence or level of human activities (noise and visual disturbance) in the program area. Temporary adverse effects can include increased levels of stress hormones, disturbance or flushing of young broods, and decreased fitness. USDA APHIS expects the adverse effects associated with this concern to be localized and temporary, and the use of mitigation measures will further reduce the risks of adverse effects.

Imidacloprid has low to moderate acute toxicity to mammals but is toxic to birds. It has low toxicity to fish, amphibians, and some aquatic invertebrates. The application method and the available effects data indicate low exposure and risk to terrestrial vertebrates (e.g., birds and mammals). The risk of imidacloprid exposure to aquatic species is negligible based on the Program's use pattern and label instructions.

Imidacloprid exposure to pollinators from the ALB Eradication Program, especially honey bees, is not expected to result in significant risk to pollinators. Pollinator exposure to imidacloprid is reduced because only treated trees and their associated flowers and pollen could have residues, while other flowering plants that have not been treated would not contain residues. Exposure and risk would increase in cases where large numbers of trees are treated over large areas prior to flowering, and in cases where only flowers from treated trees are the primary nectar source. Field monitoring data from trees treated with imidacloprid during the ALB eradication program suggest exposure levels will be low (Johnson 2012). Research indicates Program applications do not adversely impact honey bees and their hives, and levels of imidacloprid residue in pollen are low. Exposure of honeybees to imidacloprid from water is expected to be minor based on the methods of application. The programmatic EIS provides further information on imidacloprid toxicity to wildlife and its impacts to pollinators.

Exposure to terrestrial and aquatic nontarget organisms to herbicide use is expected to be minimal from each proposed formulation and mix. Significant drift or runoff is not expected as applications are not broadcast applied, but are made using a backpack sprayer to deliver a coarse droplet size or by brushing the material on individual stumps and associated sprouting

vegetation. The low probability of offsite transport for any of the products results in very low exposure to most nontarget organisms. The low probability of exposure and the favorable available effects data demonstrate that all products have a very low risk of causing adverse ecological risk.

(1) Migratory Bird Treaty Act

Potential impacts to migratory birds are not expected to increase when compared to the no action alternative. As with the no action alternative, survey activities are not anticipated to impact migratory birds. The removal of trees causes noise and visual disturbance. It is possible the Program will remove more trees initially under the preferred alternative because of the potential removal of high-risk host trees. However, tree removal activities are localized and occur over a finite period.

Imidacloprid is toxic to birds based on available studies. Methods of application for imidacloprid reduce the risks to migratory birds. This includes risk from exposure and impacts to food or habitat important for feeding and reproduction. Herbicide risk to migratory birds is low based on the favorable toxicity profile for each proposed herbicide and the method of application.

(2) Bald and Golden Eagle Protection Act

Potential impacts to bald and golden eagles are similar to the no action alternative. If bald or golden eagles are discovered near a program action area, USDA APHIS, or its State cooperator, will contact the U.S. Fish and Wildlife Service (USFWS) and implement recommendations for avoiding disturbance at nest sites. For bald eagles, USDA APHIS will follow the guidance in the National Bald Eagle Management Guidelines (USFWS 2007). USDA APHIS expects the use of imidacloprid and survey to pose a negligible risk and disturbance to bald eagles. The methods of application and survey for ALB are not expected to result in risks to food or habitat important to bald eagles. Herbicide risk to eagles is also low due to the proposed use patterns in the Program and low toxicity of each herbicide to birds.

(3) Endangered Species Act

Section 7 of the ESA and its implementing regulations require Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of critical habitat. USDA APHIS is conducting Section 7 consultation with the USFWS and National Marine Fisheries Service (NMFS) for ALB detection and eradication activities. USDA APHIS submitted a biological assessment to USFWS on July 15, 2020 that considers the actions under the preferred alternative to federally listed species within the three counties. USDA APHIS made a no effect determination for species under NMFS jurisdiction.

USDA APHIS has determined that the proposed ALB eradication program will have no effect on the West Indian manatee; Bachman's warbler; eastern black rail; piping plover; red-cockaded woodpecker; red knot; hawksbill, green sea, Kemp's ridley, loggerhead, and leatherback sea turtles; American chaffseed; Canby's dropwort; and seabeach amaranth or their critical habitats. USDA APHIS has determined that with the implementation of protection measures, the proposed program may affect, but is not likely to adversely affect the northern long-eared bat, wood stork, frosted flatwood salamander, and pondberry. USDA APHIS received concurrence from the USFWS in a letter dated July 17, 2020.

3. Human Health and Safety

In the short term, tree removal activities may result in increased noise levels from equipment and vehicles, increased stress from having trees removed from properties, increased cooling and heating costs from the reduced tree buffer, and other localized negative human health consequences from the removal of trees. Emissions and particulates from tree removal activities may cause a short-term disturbance in air quality, particularly for sensitive groups. In the long term, the negative human health consequences could be less than the no action alternative because the overall tree loss is expected to decrease as ALB is eradicated.

The Program would not girdle trees in wetlands areas that are accessible to the public to prevent tree fall injuries. In these areas, the Program would remove the trees, leaving the stumps in place to minimize soil disturbance.

Pesticide applications for ALB are conducted in a manner that minimizes significant exposure to soil, water, and air, which in turn will minimize subsequent exposure to the general public. Applicators in the ALB program are required to comply with all USEPA use requirements and meet all recommendations for personal protective equipment (PPE) during pesticide application. The proposed methods of application for imidacloprid and the herbicides in the ALB program reduce the potential for exposure and risk to human health. Transport from drift or runoff is not expected based on the methods of application. The lack of runoff and drift will protect surface and ground water that may serve as a source for drinking water.

The programmatic EIS reviewed the exposure pathway in the use of imidacloprid-treated trees for firewood and found the levels of insecticide would be low because of the way the insecticide distributes to leaves and smaller branches and the removal of trees would not be expected to occur in the same growing season, allowing for degradation of imidacloprid residues.

4. Socioeconomic

The impact to municipalities and landowners is similar to those described under the environmental consequences for the no action alternative. However, the Program will remove infested trees rather than leaving them to die in place. Therefore, the Program will bear the cost of tree removal rather than property owners. The Program may also remove high-risk host trees, which may include *N. biflora*, in proximity to infested trees.

The impacts to the forestry industry in South Carolina will initially be similar to that described under the no action alternative, but in the long-term will be less as ALB is eradicated. The Program removes and chips or incinerates infested trees and high-risk host trees or girdles these trees, making them unavailable to the timber and forestry products industry. It is possible that lightly infested trees could have salvageable wood timber and other end-use products; however, the Program does not allow the diversion of infested trees from chipping to sawmills because of the risk of spreading ALB.

5. Environmental Justice

USDA APHIS has considered the potential environmental impacts of implementing the preferred action alternative on minority and/or low-income communities. USDA APHIS expects the distance from areas to environmental justice communities to influence if there are direct adverse impacts to those communities. In general, the Program and its cooperators will reach out to landowners prior to implementing eradication activities. USDA APHIS will encourage local Program personnel to engage with locally impacted people in collaborative decisions about the Program whenever possible.

The preferred alternative is not likely to pose any highly disproportionate adverse effects to children because Program activities will not occur when children are present in the immediate area. In the event that Program activities are required on school properties there will be coordination with the appropriate school administrators to ensure that activities do not occur on or near school properties during school operating hours, or while school buses are likely to be transiting around treatment areas.

Eradication of ALB will protect the public, including low-income communities and children, from adverse effects that have been associated with ALB, such as weakened trees that are at risk of falling.

6. Tribal Consultation and Coordination

USDA APHIS will provide the Federally-recognized Tribes in the region with information about the preferred alternative actions and will offer each Tribe the opportunity to consult with the Agency. Consultation with local Tribal representatives occurs prior to the onset of program activities to inform fully the Tribes of possible actions the Agency may take on or near Tribal lands. If USDA APHIS discovers any archaeological Tribal resources, it will notify the appropriate individuals. No treatments or survey for ALB will occur on Tribal lands without coordination and approval.

7. Historic and Cultural Resources

USDA APHIS expects that the preferred alternative will not alter, change, modify, relocate, abandon, or destroy any historic buildings, edifices, or nearby infrastructure. Insecticides will not be applied to historic buildings and other anticipated program actions will not directly affect the buildings or their properties. If ALB infested trees are found on historic or cultural properties covered under the NHPA no treatments or tree removal would occur until the appropriate consultations are completed and any applicable mitigations applied. Removal of ALB-infested trees on these properties would protect the public who may visit historic and cultural properties by removing the threat of tree fall.

In accordance with Section 106 of the NHPA of 1966 and its implementing regulations, USDA APHIS prepared a Section 106 Project Review with the State of South Carolina. The document included a summary of the proposed action, the project location, a list of historic resources within the area of potential effect, as well as associated maps. APHIS sent the above-mentioned information and its analyses to the South Carolina State Historic Preservation Offices (SHPOs) for their reviews and determination whether the ALB program would affect these historic properties.

The South Carolina SHPO also requires a Department of Health & Environmental Control Ocean and Coastal Resource Management (DHEC-OCRM) project review consultation when actions may impact coastal resources. In consideration of federal Coastal Zone boundary requirements, the South Carolina Coastal Zone is defined as “all coastal waters and submerged lands seaward to the State's jurisdictional limits and all lands and waters in the counties of the State which contain any one or more of the critical areas”.

C. Uncertainty and Potential Cumulative Impacts

Uncertainty in this evaluation arises whenever there is a lack of information about the effects of a pesticide's formulation, metabolites, and properties in mixtures that have the potential to impact

non-target organisms in the environment. These uncertainties are not unique to this assessment and are consistent with uncertainties in human health and ecological risk assessments with any environmental stressor. There is uncertainty in where ALB infestations may be detected within Charleston, Dorchester, and Colleton Counties in South Carolina. Currently the only positive detections are in Charleston County but detections may increase as survey expands to other areas. Uncertainty arises from the potential for cumulative impacts from using multiple pesticides, having repeat exposures, and co-exposure to other chemicals with similar modes of action. Theoretically, cumulative impacts may result in synergism, potentiation, additive, or antagonistic effects.

Cumulative impacts on the environment result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of the entity conducting those other actions (40 CFR § 1508.7). Cumulative effects most likely arise when a relationship exists between a proposed action and other actions expected to occur in a similar location or during a similar period in time. Cumulative effects may not be reasonably foreseeable until a variety of direct and indirect impacts interact with each other or over time.

Cumulative impacts to soil, water, and air quality are not expected for the no action alternative. There may be additional insecticide treatments as ALB becomes established and expands its range in South Carolina. The lack of a coordinated eradication program would likely allow the threat from ALB to expand and serve as an additional stressor to the habitats that support ALB-host trees.

Cumulative impacts to soil, water, and air quality are not expected to be significant for the preferred alternative. Tree removal adjacent to water bodies or on soils that are erodible may increase transport of soil or sediment to water bodies, but these impacts will be short-term and incrementally negligible. Pesticide use from the preferred alternative is minor and is directed to individual trees. Imidacloprid is registered in South Carolina for various agriculture and non-agriculture uses. Environmental loading of imidacloprid will increase under the preferred alternative but the amount is incrementally negligible when compared to other uses in South Carolina. Survey is directed towards identifying ALB. ALB surveys are adaptive with survey boundaries expanding when ALB is detected, and stopped in areas confirmed free of ALB. The impacts from the actions discussed in this EA are expected to result in only minor or transient impacts; therefore, any increase in cumulative impacts will be negligible.

Vehicle emissions associated with getting to and from project sites will be minor relative to the ongoing and future emissions from urbanization, highway traffic, and agricultural production. Any increases in air pollutants associated with program activities and vehicle emissions will cease upon completion of program activities at each site. Future actions that could increase emissions (e.g., housing developments and road expansions leading to more traffic) are difficult

to quantify because emissions from mobile sources are subject to changing fuel mileage and emissions standards and regulations. Nevertheless, the contribution from the preferred alternative will remain minor compared to the overall emissions in the program area.

USDA APHIS expects the potential human health impacts related to the preferred alternative to be minimal and in the context of potential cumulative impacts to past, present, and future activities, these impacts will be incrementally minor. The greatest sectors of the human population at risk of exposure to pesticides are program workers and applicators; however, these risks are minimized by using PPE. The lack of significant routes of exposure to human health and the environment, suggest cumulative impacts will not occur.

IV. Listing of Agencies Consulted

Environmental and Risk Analysis Services
Policy and Program Development
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 149
Riverdale, MD 20737

Plant Protection and Quarantine
Emergency and Domestic Programs
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road
Riverdale, MD 20737

South Carolina Department of Plant Industry
Clemson University
Regulatory Services
511 Westinghouse Road
Pendleton, SC 29670

U.S. Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

NOAA Fisheries
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL, 33701

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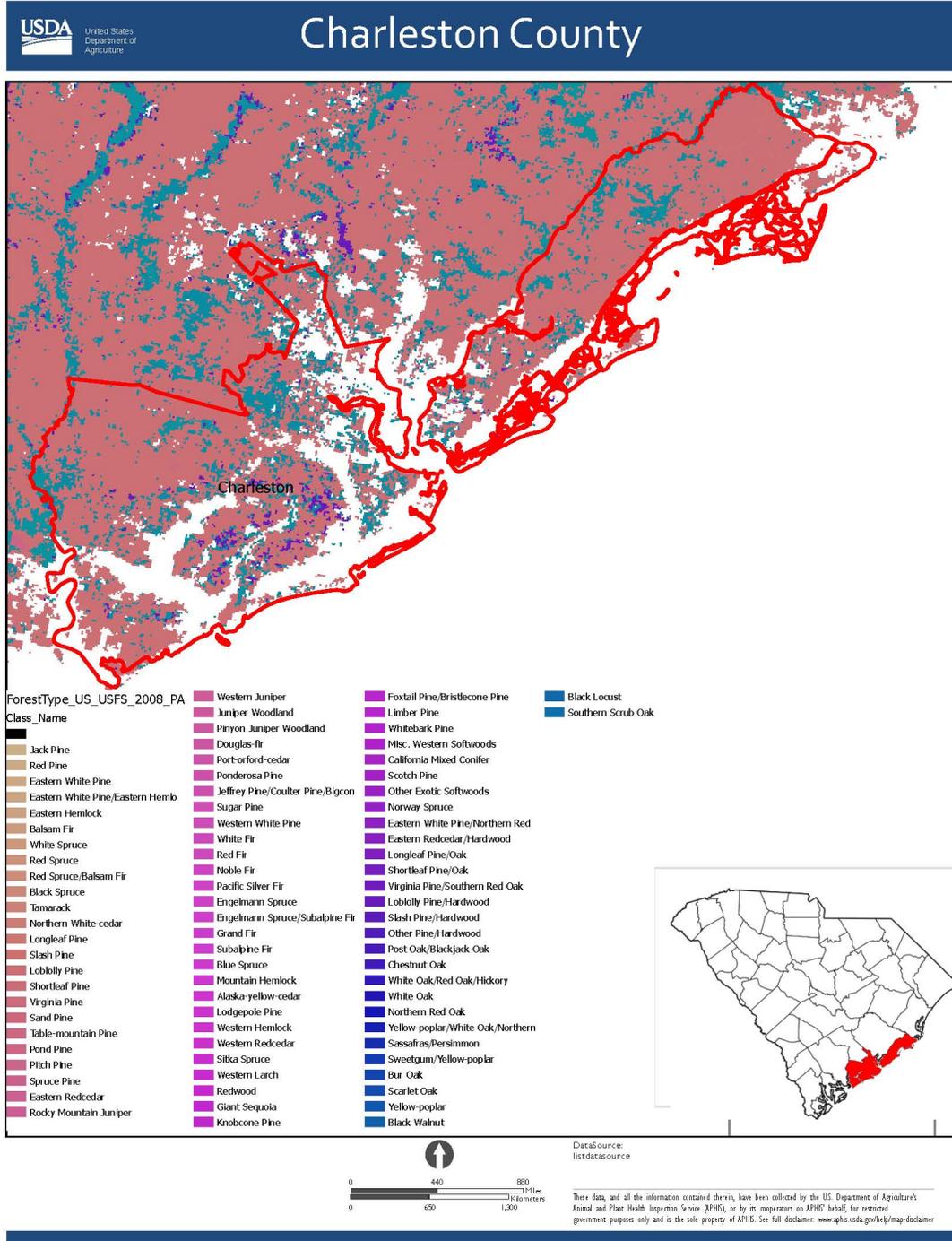
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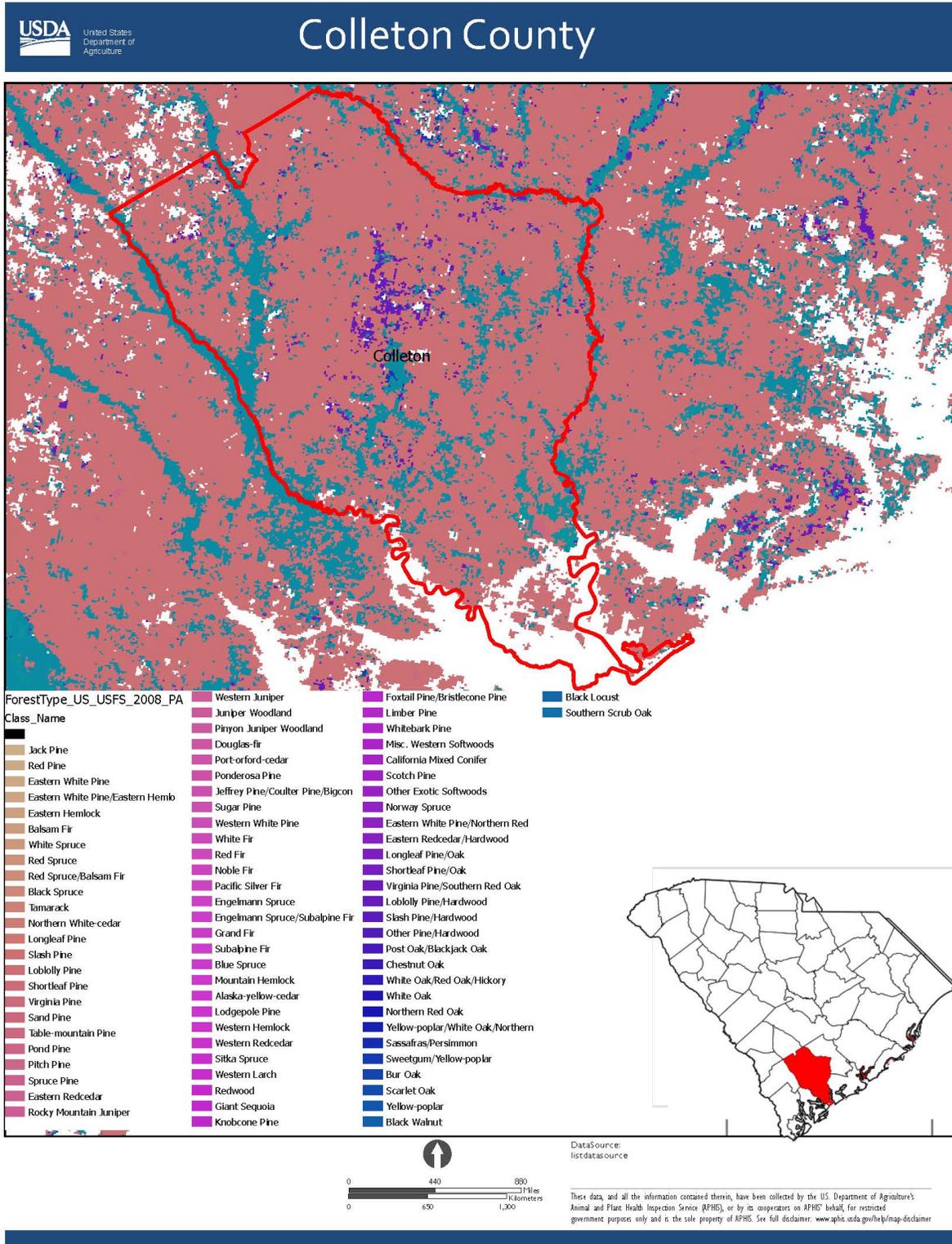
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Appendix 1. Forest type covers for Charleston, Colleton, and Dorchester Counties, SC

Charleston County



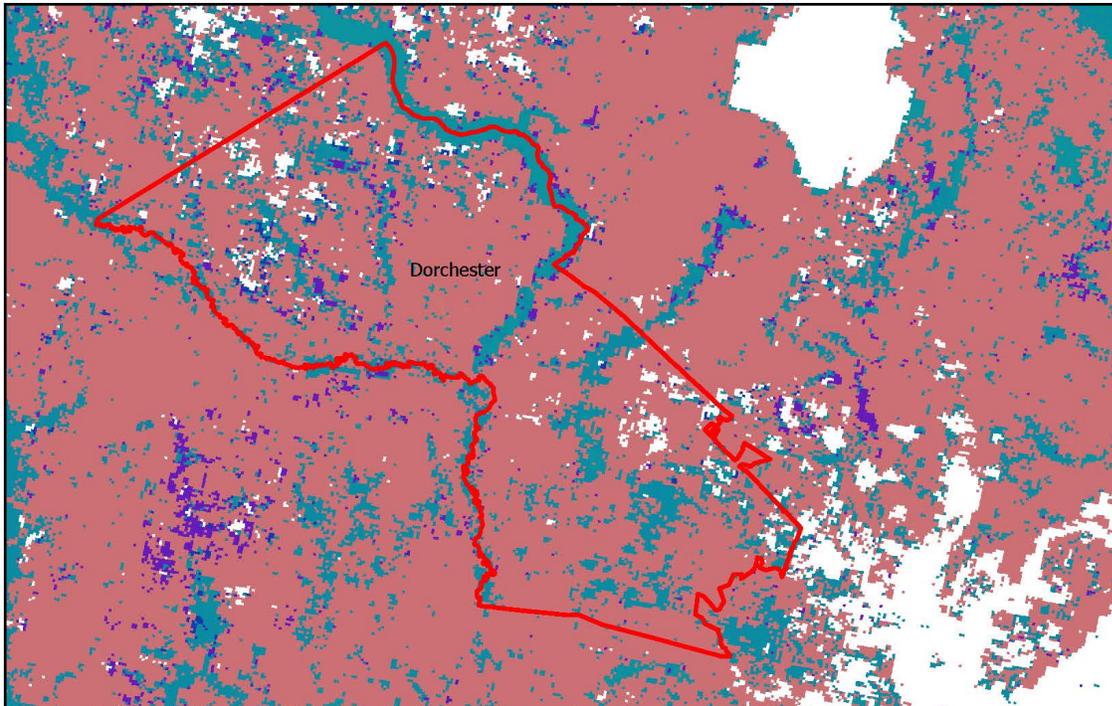
Colleton County



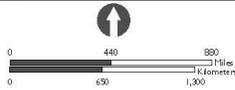
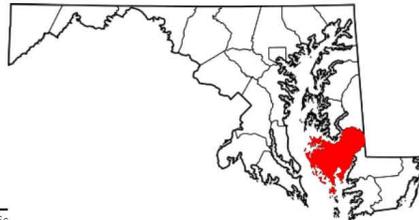
Dorchester County



Dorchester County



ForestType_US_USFS_2008_PA Class_Name	Color	ForestType_US_USFS_2008_PA Class_Name	Color	ForestType_US_USFS_2008_PA Class_Name	Color
Jack Pine	Light Green	Western Juniper	Pink	Foxtail Pine/Bristlecone Pine	Light Purple
Red Pine	Light Green	Juniper Woodland	Pink	Limber Pine	Light Purple
Eastern White Pine	Light Green	Pinyon Juniper Woodland	Pink	Whitebark Pine	Light Purple
Eastern White Pine/Eastern Hemlock	Light Green	Douglas-fir	Pink	Misc. Western Softwoods	Light Purple
Eastern Hemlock	Light Green	Porterford-cedar	Pink	California Mixed Conifer	Light Purple
Balsam Fir	Light Green	Ponderosa Pine	Pink	Scotch Pine	Light Purple
White Spruce	Light Green	Jeffrey Pine/Coulter Pine/Bigcone Sugar Pine	Pink	Other Exotic Softwoods	Light Purple
Red Spruce	Light Green	Western White Pine	Pink	Norway Spruce	Light Purple
Red Spruce/Balsam Fir	Light Green	White Fir	Pink	Eastern White Pine/Northern Red	Light Purple
Black Spruce	Light Green	Red Fir	Pink	Eastern Redcedar/Hardwood	Light Purple
Tamarack	Light Green	Noble Fir	Pink	Longleaf Pine/Oak	Light Purple
Northern White-cedar	Light Green	Pacific Silver Fir	Pink	Shortleaf Pine/Oak	Light Purple
Longleaf Pine	Light Green	Engelmann Spruce	Pink	Virginia Pine/Southern Red Oak	Light Purple
Slash Pine	Light Green	Engelmann Spruce/Subalpine Fir	Pink	Loblolly Pine/Hardwood	Light Purple
Loblolly Pine	Light Green	Grand Fir	Pink	Slash Pine/Hardwood	Light Purple
Shortleaf Pine	Light Green	Subalpine Fir	Pink	Other Pine/Hardwood	Light Purple
Virginia Pine	Light Green	Blue Spruce	Pink	Post Oak/Blackjack Oak	Light Purple
Sand Pine	Light Green	Mountain Hemlock	Pink	Chestnut Oak	Light Purple
Table-mountain Pine	Light Green	Alaska-yellow-cedar	Pink	White Oak/Red Oak/Hickory	Light Purple
Pond Pine	Light Green	Lodgepole Pine	Pink	White Oak	Light Purple
Pitch Pine	Light Green	Western Hemlock	Pink	Northern Red Oak	Light Purple
Spruce Pine	Light Green	Western Redcedar	Pink	Yellow-poplar/White Oak/Northern	Light Purple
Eastern Redcedar	Light Green	Sitka Spruce	Pink	Sassafras/Persimmon	Light Purple
Rocky Mountain Juniper	Light Green	Western Larch	Pink	Sweetgum/Yellow-poplar	Light Purple
		Redwood	Pink	Bur Oak	Light Purple
		Giant Sequoia	Pink	Scarlet Oak	Light Purple
		Knobcone Pine	Pink	Yellow-poplar	Light Purple
				Black Walnut	Light Purple
				Black Locust	Dark Blue
				Southern Scrub Oak	Dark Blue



Data source: listdatasource

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B. Satellite image map (as of July 28, 2020)

