RISK BASED APPROACH (RBA) FOR ACHIEVING CONFORMANCE WITH THE NETHERLANDS' SDE+ SUSTAINABILITY REQUIREMENTS

FOR CATEGORY 2 BIOMASS SOURCED FROM SMALL FOREST MANAGEMENT UNITS (FMUS) (<500 HECTARES) IN THE US

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FOREWORD AND VENDOR QUALIFICATION

The American Forest Foundation (AFF) was engaged in January 2020 to develop a risk-based approach (RBA) for achieving conformance with the Netherlands' SDE+ sustainability requirements for Category 2 biomass sourced from small Forest Management Units (FMUs) (<500 hectares) in the US. AFF is a non-profit conservation organization that protects and measurably increases clean water, wildlife habitat, and sustainable wood supplies that come from family-owned forests. AFF works with landowners, partners, leading businesses, and policymakers to address key issues such as conserving biodiversity, reducing risk of catastrophic wildfire, and addressing the threat of climate change.

AFF has engaged in and tracked processes associated with developing and implementing the Netherlands' SDE+ sustainability requirements for biomass over the last five years. AFF understands the complexity the legislation presents for all actors in the supply chain, including family landowners, pellet producers, and energy generators. With these complexities in mind, AFF is strategically positioned to support a solution for achieving conformance with the SDE+ framework for fiber originating in family woodlands in the US (Category 2) using a risk-based approach (RBA) under the Verification Protocol.

As the trusted and valued partner to family forest owners in the U.S., as well as a broad range of organizations, including federal and state public agencies, private industry, and conservation organizations, AFF is uniquely positioned and well-suited to develop an RBA, including the development and implementation of required on-the-ground mitigation activities. Similarly, AFF is recognized for its innovative approaches, cutting edge use of technology, robust analyses, and credible, technical expertise in the areas of sustainability assurance and stakeholder engagement.

To complement the expertise and skillset of AFF's team in support of the RBA development and further promote the RBA's integrity, AFF contracted with several external organizations with specific subject matter expertise to provide both specific section and full scope reviews of the RBA. AFF has engaged Southern Forestry Consultants (SFC), SCS Global Services (SCS), Peterson Consulting, and NatureServe. SFC is developing additions and appendices to existing Landscape Management Plans (LMP) in Florida and South Carolina, as well as an LMP under development in Georgia. SCS provided consultation, pre-audit review, and advice on auditing options. Peterson provided consultation, pre-audit review, and advice on application. NatureServe provided data and expertise for risk assessments related to species and ecosystems. Detailed organization descriptions can be found in Annex III.

INTRODUCTION

The American Forest Foundation (AFF) has engaged in and tracked processes associated with developing and implementing Dutch SDE+ sustainability requirements since 2015. AFF understands the complexity the legislation presents for all supply chain actors, including family landowners, pellet producers, and energy generators. With these complexities in mind, AFF is strategically positioned to support a solution for achieving conformance with the SDE+ framework for fiber originating in family woodlands in the United States (Category 2) through a risk-based approach (RBA) under the Verification Protocol.

There is growing recognition that an RBA, under the Verification Protocol, presents a cost-efficient means for demonstrating the sustainability of Category 2 biomass to be used in the Dutch market under SDE+. Below is the definition of Category 2 biomass, as described in the Verification Protocol.

> **Category 2: Woody biomass from small Forest Management Units (FMU <500 HA)**
> *This includes branches, tops, trees, and primary felling residues sourced directly from forests of less than 500 ha. This shall also include unused wood that has the same composition as wood growing in the forest, and that has not been mixed with or contaminated by foreign materials or substances. Category 2 biomass is distinguished from Category 1 biomass based on the size of the forest management units. Biomass from FMUs smaller than 500 hectares can also be submitted as Category 1 biomass, in which case the sustainability criteria for Category 1 biomass shall apply.*

According to the Netherlands Enterprise Agency (RVO) Verification Protocol for Sustainable Solid Biomass for Energy Applications commissioned by the Ministry of Economic Affairs and Climate policy, a biomass producer can demonstrate compliance with applicable SDE+ sustainability requirements using a risk-based approach for small forest lands by following the procedures outlined in Chapter 8 of the Verification Protocol, through the end of 2022. The risk-based approach is a viable pathway, well-matched to family woodlands, and is commensurate with the scale of sourcing at a landscape level.

To fully meet the SDE+ sustainability requirements, there is an increasing need for a risk-based approach to ensure sustainable biomass sourcing. AFF and key stakeholders have collaborated to develop an RBA to SDE+ under the Verification Protocol. Importantly, the RBA can work together with certification expansion, draw on the infrastructure for growth, and enable dual-purpose engagement of landowners to meet mitigation needs.

In the short-term (through the end of 2022), an RBA can provide SDE+ compliant biomass. As noted in Chapter 8 of the Verification Protocol, "small-scale forest management units (less than 500 hectares) in a specific region do not need to undergo individual verification to demonstrate compliance with the SFM criteria. The biomass producer (usually a pellet mill) shall have evidence available to demonstrate that, for each of the SFM criteria, the (mitigated residual) risk level is 'low.' The RBA can also be used for demonstrating compliance with the controlled biomass criteria."

An RBA is the most cost-effective and efficient strategy for verifying that Category 2 wood meets SDE+, enabling access to the subsidy for energy generators before 2022. Similarly, as noted above, a successful RBA may support discussions around using the approach as a credible option for SDE+ long term. However, the current law states that after 2022, the only way to meet SDE+ is by the use of approved certification schemes. Thus, under current legislation, there is an urgent need to grow certification amongst smallholders in the US Southeast as a long-term strategy. However, at present, ATFS is the only certification system that effectively engages family landowners at a meaningful scale.

The RBA enables the consideration of family lands as a segment source of feedstock and assessment of sustainability at a scale commensurate with sourcing. As such, it is a good option for family woodlands in the US.

Without a viable pathway for family woodlands, via the RBA, the Dutch sustainability requirements will disqualify the bulk of wood supplies and forgo the chance to drive forest conservation outcomes on the ground in the US through family landowner engagement. This RBA offers a match for the unique situation of American family landowners and a rigorous method of demonstrating the sustainability of sourcing for the Dutch energy sector. While AFF is not involved in sourcing material, buyers of wood are looking for options for verifying non-certified sources' sustainability. Using an RBA, paired with credible mitigation and monitoring systems, can provide viable compliance with SDE+ at the landscape level.

LAND OWNERSHIP CHARACTERISTICS OF THE U.S.

The United States is home to approximately 741 million acres, or 300 million hectares, representing 7.5% of the world's forests. The country has a strong culture and history of sustainable forestry that supports healthy forests and results in annual forest growth greater than annual harvests. The forests across the US provide companies, consumers, conservation groups, and government agencies with myriad benefits. Unlike many countries, where forest land is owned and managed primarily by the state, most US forest land (60%) is owned by private landowners, most of whom (more than 10 million) are family forest owners. Families and individuals, who own the largest portion of privately owned forests, are vital to ensuring they are productive. The average ownership size for a family forest is 67 acres. Most of these landowners manage their forestland sustainably to ensure they can enjoy it today and that it will be part of their family's legacy for generations to come.

FAMILY FOREST OWNERS OWN THE LARGEST PORTION OF U.S. FORESTS[1]
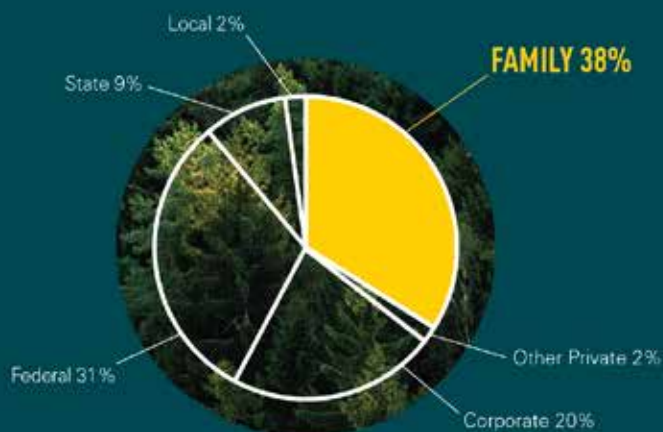
The average ownership size for a family forest is 27 HECTARES[2]

There are 21 million family forest owners in the U.S.[3], or 1 IN 4 rural Americans.

Collectively, there are 117 MILLION HECTARES of family-owned forests in the U.S. This is more than the area of Germany, Czech Republic, Switzerland, Poland, Italy and Austria combined.[4]

Pie chart labels: Local 2%, State 9%, FAMILY 38%, Federal 31%, Corporate 20%, Other Private 2%

1 U.S. Forest Service. 2019. Forest Resources of the United States.
2 U.S. Forest Service. 2013. Forest Ownership of the United States.
3 Brett Butler, U.S. Forest Service. 2017. Proprietary research.
4 U.S. Forest Service. 2016. National Woodland Owner Survey.

UNIQUE NATURE OF FAMILY WOODLANDS (CATEGORY 2, <500 HA) AND EVALUATION OF RISK

In developing an RBA as a comprehensive assurance system associated with sourcing on Category 2 lands (<500 HA) against the SDE+ criteria, it is critical to consider the unique nature of family woodlands in the United States. It is especially important to put family woodlands in the context of the US South, a principle sourcing region world-wide and a setting with a strong presence of large, industrial forest operations. Paragraph 8.3.1 of the Dutch Verification Protocol suggests that risk analyses should be tailored to appropriately address the level of complexity of processes being assessed. Paragraph 8.3.2 recognizes that both the probability of non-compliance and the scale of potential impact should be considered when evaluating risk. Further, Chapter 6 of the VP states, "The scale and intensity of the forest management will influence the risk of non-compliance …". As such, in assessing risk and identifying appropriate mitigation options, it is important to consider several critical factors: the size of holdings, the scale of operations, and intensity of management. These specific attributes also should be considered in the context of the wider set of operations that would also be considered under SDE+.

Scale denotes relativity to other operations. According to the latest results of the US Forest Service Forest Inventory and Analysis (FIA) and the National Woodland Owner Survey (NWOS), the collective scale of family ownerships in the geography of interest is substantial, comprising roughly 49% of the forested land base across the Southeast US (Butler et al. 2020, Table 1). The family share of forests can be as high as 90% in some counties within the RBA scope. However, these lands are comprised of hundreds of thousands of individual parcels, owned by approximately 574,000 individual managers in the RBA's geography. As such, the collective scale of family-owned forests is significant, but the scale of individual operations and management units' size are quite modest.

Scale generally cannot be a factor in individual FMU's supplying Category 2 biomass when compared to a broader landscape base and the large scale industrial/portfolio ownerships in this region, many of which include tracts of 10,000 acres and larger. (Note: in this assessment, FMU's eligible for supplying Category 2 biomass, as defined in the VP, may be referred to simply as "Category 2 lands".)

Similarly, the size of individual family holdings is small, with 93% of family ownerships with parcels smaller than 199 acres (80 hectares). The median holding size is 25 acres for ownerships with at least 10 acres (Butler et al. 2020, Table 4). As such, most Category 2 lands are well below the 500 HA threshold.

The intensity of management is the third consideration for application in risk assessment. SDE+ does not define "intensive management." The USDA Forest Service Southern Research Station's web-published Glossary of Forest Engineering Terms provided guidance and determined relevance for family woodlands. It defines "Intensive forest management" as "Utilization of a wide variety of silvicultural practices, such as planting, thinning, fertilization, harvesting, and genetic improvement, to increase the capability of the forest to produce fiber."

To determine the extent to which this term would appropriately be applied to family woodlands, generally and for Category 2 (under 500 HA), the National Woodland Owner Survey (NWOS) results were reviewed (Butler et al., 2020). Per the identified definition, intent to "produce fiber" is a driving factor for intensive management. However, relatively few, 15% of all family ownerships, feel that production of timber products is "very important" as a reason for owning their land, and that is likely to skew more toward the larger holdings (likely larger than 500 HA), given production interest increases with the size (Butler et al. 2020, Table 7). Only "very important" responses were included because that level of interest correlates most closely to a primary purpose for management. Similarly, roughly 20% (Butler et al. 2020, Table 14) cut trees for sale in the last five years, suggesting a lesser intensity of management for most family landowners. While fertilization and genetic improvement are not included in the survey, when the use of "a wide variety of silvicultural practices" is considered, 15% or fewer of family ownerships report implementing other activities that would be production driven activities. Again, respondents reporting these activities seem likely to be in the minority of family landowners at the larger end of the Category 2 range (>100 acres or 40 HA). In this region, 85% of family ownerships are 100 acres or smaller (<40HA) (Butler et al. 2020, Table 4).

Other analyses of the per acre inventories of growing stocks by ownership suggest that, despite owning a larger share of forests, family ownerships are less intensively managed than Timber Investment Management Organization (TIMO)/Real Estate Investment Trust (REIT) ownerships, which have been shown to carry lower growing stocks per acre than on family forest lands and higher harvest removal volumes per acre than family forest lands (Zhang et al. 2012 pp359).

Finally, a range of experts was engaged, including researchers and foresters, and stakeholders. There is consensus that, while there is a small minority of family woodland owners that may intensively manage their woodlands, most family landowners are not. This is particularly true for landowners with parcels of 500 or fewer hectares. Several stakeholders suggested that family woodlands under 500 HA would be categorically excluded as intensive managers by size alone in that one cannot manage intensively without more land. The average holding

size for landowners that own 10 acres or more is 71.5 acres, and the median is 25 acres (Butler et al. 2020, Table 4). With a parcel of 71 acres (or 28.7 HA), a landowner would incur a greater cost in managing intensively than could be recovered in profits, given the costs of operation and small volumes produced. In addition, as noted above, very few landowners have objectives that would motivate intensive management in any case.

In summary, there are several interdependent characteristics that collectively describe the unique condition of Category 2 lands relative to other ownership classes in the region, and which underpin the general approach taken in applying the SFM criteria to these lands: a) these lands are small in size relative to other classes of ownership. The small size of these lands, combined with their variably dispersed geographic locations, means any impacts on individual FMUs are equivalently small and diluted across the landscape; b) the overwhelming majority of these lands are managed at low intensity in terms of silvicultural interventions and related activities. Consequently, the potential for adverse ecological impacts on these FMUs is further attenuated by the infrequent and moderated intensity of activities; c) applying FMU-level verification audits on hundreds of thousands of small properties is entirely cost-prohibitive; and, d) even though these lands are characteristically small and low impact, because there are so many category 2 FMUs throughout the region, collectively they are a significant segment of the forest products market supply.

VALUE OF AN RBA

The SDE+ requirements were developed to apply globally and at the FMU level. By design, they are not well-matched to small scale family ownerships and their operations, generally, and particularly in the context of the US South. Indeed, many of the criteria are poorly adapted for the application of the average size, scale, and intensity of family ownerships. FMU level evaluation for Category 2 lands in the US is, in our view, not appropriate. The RBA enables the consideration of family lands as a segment source of feedstock and assessment of sustainability at a scale commensurate with sourcing. As such, it is a good option for family woodlands in the US.

Without a viable pathway for family woodlands, via the RBA, the Dutch sustainability requirements will eliminate the bulk of wood supplies and forgo the chance to drive forest conservation outcomes on the ground in the US through family landowner engagement. This RBA offers a match for the unique situation of American family landowners and a rigorous method of demonstrating the sustainability of sourcing for the Dutch energy sector.

Even as AFF works to expand ATFS certification each year, it is apparent that forest certification may have limitations in its application to family landowners in the United States. While AFF is not involved in sourcing material, buyers of wood are looking for options for verifying the sustainability of non-certified sources. Using a risk-based analysis, paired with credible mitigation and monitoring systems, can provide viable compliance with SDE+ at the landscape level.

RBA OVERALL METHODOLOGY

VIABILITY EVALUATION

To understand the viability of a Risk-Based Approach (RBA) methodology for achieving and demonstrating compliance for Category 2 biomass (originating on landholdings less than 1236 acres/500 hectares) under SDE+ Sustainability Requirements via the Verification Protocol (January 2020 version), AFF conducted an initial analysis. This desk review evaluated the suitability of the RBA for the demographic and identified potential pathways for assessing risk and demonstrating compliance for each indicator and made recommendations, drawing on alignment with existing laws, regulations, and applicable programs available in the US with a focus on the US South.

Drawing on this work, AFF developed a framework for the implementation of an RBA for South Carolina, Georgia, and northern Florida. This 3-state RBA sets the stage for a much larger deployment of the RBA approach, across the US Southeastern region, including other Gulf States and the mid-Atlantic regions, which have been identified priority regions for Dutch-bound biomass production.

RISK-BASED APPROACH: OVERVIEW

Per the Verification Protocol, by following the procedures for a Risk-Based Approach (RBA), small-scale FMUs (< 500 ha) in a specific region do not need to undergo individual verification to demonstrate compliance with the SFM criteria. The RBA developer shall have evidence available to demonstrate that, for each of the SFM criteria, the (mitigated residual) risk level is "low." The RBA can also be used for demonstrating compliance with the controlled biomass criteria.

During verification, the biomass producer shows the Conformity Assessment Body (CAB) that the RBA was conducted in accordance with the requirements described in the verification protocol. As part of the verification, the CAB consults relevant stakeholders. When applying an RBA for small FMUs, the biomass producer must maintain documentation to demonstrate biomass originates from in FMUs smaller than 500 ha.

This RBA was developed by AFF by a commission of the DBC Foundation to support use by biomass producers and may cover the supply bases of several biomass producers together.

The RBA involves the following process steps:
- determination of the region;
- gathering of information in relation to the SFM requirements;
- risk assessment;
- mitigation measures (establishment and regular monitoring of measures to prevent the sourcing of biomass with a specified);
- regular monitoring of the risk assessment and the mitigation measures put in place.

Each of these steps is outlined in general terms below and described in detail in a specific section of this RBA. The following figure illustrates the RBA process, and the methodology associated with each step is described in the following pages.

Figure 1. AFF's Risk-Based Approach (RBA) Process
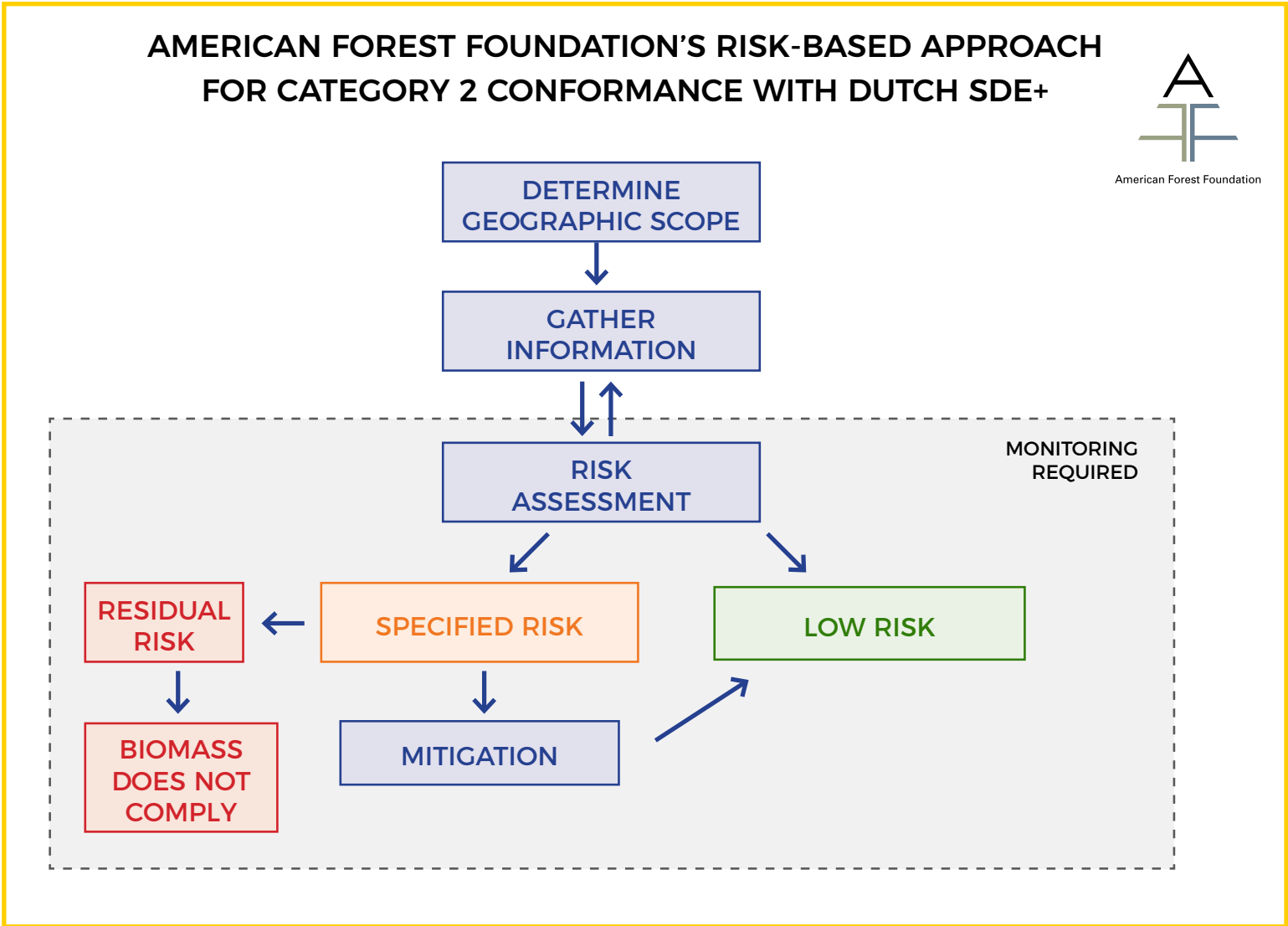
AMERICAN FOREST FOUNDATION'S RISK-BASED APPROACH
FOR CATEGORY 2 CONFORMANCE WITH DUTCH SDE+

American Forest Foundation

DETERMINE GEOGRAPHIC SCOPE

GATHER INFORMATION

RISK ASSESSMENT

MONITORING REQUIRED

RESIDUAL RISK

SPECIFIED RISK

LOW RISK

BIOMASS DOES NOT COMPLY

MITIGATION

DETERMINATION OF THE REGION

Geographic Scope for the RBA Assessment of Northern Florida, Georgia, and South Carolina Methodology

The geographic scope for the 3-state area of Florida (FL), Georgia (GA), and South Carolina (SC), Risk-Based Approach (RBA) covers a region that is interrelated through legal, cultural, operational, jurisdictional, ecological, and functional characteristics. The Verification Protocol for Sustainable Solid Biomass for Energy Applications requires the biomass producer to identify "*one or more homogeneous areas (regions) from which to source biomass. These regions can be determined both on a geographical scale (e.g., states, counties, province) and on a functional scale (forest type, ownership, the scope of management, type/quality of the forest. The boundaries of an area shall be clearly identified on maps and in other relevant documentation.*" Biomass sourcing in these three southern states creates a frame for this geographic scope. The regions offer homogeneity at multiple scales, recognizing that ecological boundaries often transcend jurisdictional boundaries. This homogeneity is described in more detail in the section Determination of Geographic Scope and illustrated on accompanying maps.

Please see the geographic scope section of the RBA for additional details.

GATHERING INFORMATION IN RELATION TO THE SFM REQUIREMENTS

The Verification Protocol specifies that the development of an RBA process includes gathering information on identified areas relevant for the risk analysis with respect to the SFM requirements.

Below is a general overview of the Verification Protocol's requirements for information gathering. However, this RBA contains detailed sections on each element of information gathering, especially stakeholder consultation.

DOCUMENTS

This includes gathering relevant documentation, such as laws and regulations, government statistics, NGO reports, expert studies, and maps, as part of the information gathering exercise. The review includes assessing the relevance and reliability of the information using objective criteria, such as date of publication, reliability, and independence of the source (academic institutions, international agencies, NGOs, and government bodies), methodology, etc. Data sources are referenced so the Conformity Assessment Body and other external parties can verify them.

CONSULTATION OF STAKEHOLDERS AND EXPERTS

Consultation with stakeholders and experts is a required and essential source of information for developing the RBA's risk assessment. The consultation includes gathering the input of individuals or groups with an interest, either directly or indirectly, in the RBA.

The stakeholder consultation section of this RBA describes the identification of stakeholders, procedures for consultation, and how the consultation informed the RBA's development.

RISK ASSESSMENT

AFF conducted a thorough assessment of each of the sustainability indicators that apply to Category 2, in accordance with the directions outlined in Chapter 8 of the SDE+ Verification Protocol. The VP establishes that criterion level conformance is determined by and reliant upon demonstrated conformance with each corresponding indicator. The information assessed for each indicator was collected according to the RBA's information gathering process. Where indicators were not suitable for a risk assessment at the regional level (e.g., indicators can only be used at an FMU level), other means of verification were deployed and substantiated. An evaluation method was identified for each indicator. Recognizing the complexity of many of the sustainability elements addressed in the SDE+ requirements and the multiple variables that influence performance, where feasible, AFF sought to include both quantitative and qualitative analyses, as well as two analytical methods, to yield the most robust conclusion.

Analyses were conducted by qualified professionals with relevant experience and expertise to ensure the RBA's credibility overall. Secondary reviews were conducted by SCS Global Services (US) and Peterson (Netherlands) to provide additional assurance as to the quality of the risk assessment.

A listing of qualifications of the persons involved in performing the risk assessment found in Annex III demonstrates they are qualified (through training and experience) to perform risk analyses tailored to the complexity of the processes and information being assessed and the country or region under assessment. The peer review by experts can provide additional assurance as to the quality of the risk assessment.

RISK ASSESSMENT IDENTIFICATION OF RISK

In accordance with section 8.3.2 of the Verification Protocol, the risk of non-compliance for each requirement applying to Category 2 is expressed as "low risk" or "specified risk" based on the analyses conducted and the indicators set out in the protocol. For each of the indicators, a rationale for risk designation is provided, drawing on the analyses conducted. As a result, for indicators with designated risk, the related criterion is also designated with specified risk aligning with the VP's requirement that that compliance with criteria is dependent on compliance with all applicable underlying indicators.

"Low risk"

A "low risk" is identified when there are clear indications, through our analyses, that the chance of non-compliance with the relevant sustainability criterion in combination with the consequences is small, and the risk analysis has yielded no information that leads to a "specified risk" designation.

"Specified risk"

A "specified risk" is identified when there is not enough information for the risk assessment to establish whether the risk is low or when the mitigating measures are not sufficiently effective in reducing the chance that identified risks materialise or in reducing the consequences of such risks. In case of doubts, a precautionary approach shall be applied.

RISK MITIGATION AND MEASURES

For a region with a "specified risk" designated with regard to SFM criteria, mitigating measures must be defined in order to reduce the risk level to "low risk." Mitigation measures required of this RBA are specific to the unique nature of sourcing from family-owned forests, Category 2, in this region of the US.

In the event that the risk of non-compliance for one or more SFM criteria remains a "specified risk" even after the introduction of mitigation measures, biomass from that region cannot be classified as conformant with Dutch SDE+ SFM requirements.

ESTABLISHMENT AND REGULAR MONITORING OF MITIGATION MEASURES

A review of the risk assessment and the mitigation measures shall be conducted at least once per year. In the event of any relevant developments in the region from which biomass is sourced and/or relevant changes in the information gathered for a particular region or criterion, modifications will be made as warranted.

Monitoring of the RBA and mitigation activities is essential for maintaining the system's integrity in providing assurance of compliance with SDE+ for Category 2 sourcing on family-owned woodlands in the geographic scope.

As the party responsible for the development and maintenance of the RBA, AFF is responsible for overall RBA monitoring and monitoring (validation) of mitigation, as a key facet of the system.

RBA monitoring includes the following measures:
- Annual review of all risk designations in the RBA to determine if revised analyses are required, based on the availability of new data, availability of additional or alternative analytical methodologies, analysis of implemented mitigation (see below), and feedback from stakeholders and RBA users.
- Annual review of all mitigation measures identified in the RBA to determine if revised measures are required, based on the availability of new data, effectiveness assessment of implemented mitigation (see below), feedback from stakeholders, experts, and RBA users.
- Twice annual interviews with RBA users to gauge the effectiveness and generate insight into the RBA's improvement and identify needs for guidance and interpretation.
- Ongoing monitoring of family landowner activities via the American Tree Farm System (ATFS), where the program provides a viable method when used in concert with the other methods identified above.
- Publication of a public monitoring summary and resulting revisions to the RBA.

In addition, AFF is responsible for monitoring and evaluating the effectiveness of mitigation. The monitoring of mitigation activities is central to the function of the RBA. The performance of mitigation activities is a key input into the monitoring of the RBA as a whole and must be consistently implemented and reported.

Monitoring of mitigation includes:
- On-site verification of mitigation actions on a sample of mitigation sites to verify activities was appropriately implemented.
- On-site effectiveness evaluation on a sample of mitigation sites to verify activities are effective in subsequent years.

DETERMINATION OF THE REGION

GEOGRAPHIC SCOPE FOR THE RBA ASSESSMENT OF NORTHERN FLORIDA, GEORGIA, AND SOUTH CAROLINA
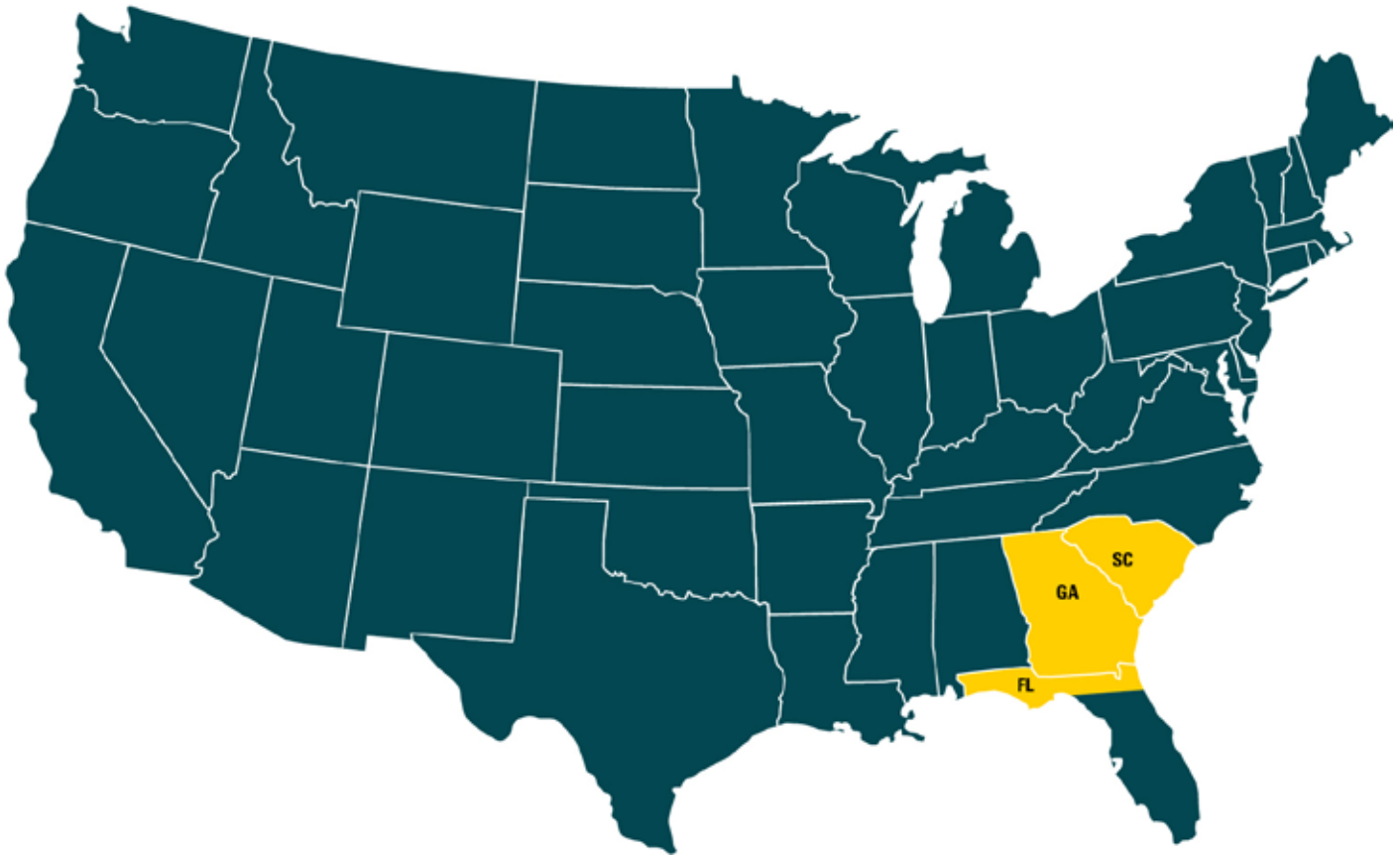
METHODOLOGY

The geographic scope for the 3-state area of Florida (FL), Georgia (GA), and South Carolina (SC), Risk-Based Approach (RBA) covers a region that is interrelated through jurisdictional, ecological, and functional characteristics. The Verification Protocol for Sustainable Solid Biomass for Energy Applications requires the biomass producer to identify "one or more homogeneous areas (regions) from which to source biomass. These regions can be determined both on a geographical scale (e.g., states, counties, province) and on a functional scale (forest type, ownership, scope of management, type/quality of forest). The boundaries of an area shall be clearly identified on maps and in other relevant documentation." This homogeneity is described in more detail below and illustrated on accompanying maps.

ADMINISTRATIVE AND REGULATORY DIVISIONS

The geographic scope of this assessment is located within the conterminous United States and spans the entire states of Georgia and South Carolina, and a subset of counties in northern Florida, roughly the upper third of the state (see Map #1). The southern two-thirds of Florida were not included in this scope, both because this area falls outside the dominant regions for biomass sourcing and because the habitat types in southern Florida

are distinct from the rest of the scope. Although these states do have some differences in state-level (and local-level) regulation, they also share many similarities, as described below. Additionally, overarching federal level regulations serve to align state regulation and create further homogeneity across each state.

These three states share similar common forestry practices and standards. Although each state has developed its own set of Best Management Practice (BMP) standards for forestry, these BMPs share similar principles and guidelines across each state, and each covers a set of elements including timber harvest, streamside management zones (SMZ), stream crossings, forest road construction and maintenance, site preparation and reforestation, prescribed burning, pesticides and fertilizers, safety, and waste disposal. BMPs in this region direct forest landowners and the professional forestry community with guidelines to follow in practicing good stewardship. Specifically, the BMPs of each of these three states direct forestry professionals to protect water quality and habitat by reducing non-point source pollution, maintaining soil integrity and stability, conserving site productivity, and conserving the essential elements of wildlife habitat. (For more information on Best Management Practices, see Annex V.)

Although state BMPs are technically voluntary programs, the overarching federal regulation, as well as indirect pressure from professional forestry and logging requirements, lead to their widespread implementation in forest management across all three states. State BMP administrative programs report compliance between 88-98% in these states. Georgia and South Carolina require state licensure and registration in order to practice forestry. In addition, all three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All programs are attended by the majority of professional loggers operating in each state: at the time of writing, Georgia has just under 1,400 active participants, Florida has over 400 participants, and South Carolina has over 1,100 participants.

Forestry practices in each of these states are subject to federal regulations, which are also typically referenced in and tied to state BMP manuals. Regulations around non-point source pollution within this geographic scope follow requirements under sections 208 and 319 of the federal Clean Water Act, and these federal regulations direct states to identify and implement best management practices. The United States Environmental Protection Agency (EPA) enforces and administers the Clean Water Act. Additional federal-level regulation applicable to this RBA includes the Endangered Species Act, regulations set by the United States Department of Labor Occupational Safety and Health Administration (OSHA), and legislation around waste disposal and prevention of chemical and biological pollution/contamination. All forestry practices in this geographic scope must comply with the Endangered Species Act, the primary law in the US that protects imperiled species and their habitat. In addition, Congress requires an approved State Wildlife Action Plan (SWAP) for state agencies to receive State Wildlife Grants, the main federal funding source for states for wildlife conservation.

Though these plans are developed at a state level, they are part of a coordinated nationwide effort by all 50 states and 5 US territories to develop action plans. Florida, Georgia, and South Carolina each have developed and continue to implement their SWAP, which contains the following elements, as required by Congress:

1. Distribution and abundance of wildlife species,
2. Locations and condition of key habitats and community types,
3. Wildlife and habitat threats,
4. Conservation actions to address these threats,
5. Plans for monitoring species, habitats, and the effectiveness of conservation actions,
6. Plans for review and adaptive management of the strategy,
7. Plans to coordinate strategy development, implementation, and review with Federal, state, local agencies, and Indian tribes, and
8. Opportunities for broad public participation in plan development and implementation.

The health and safety of forest workers are protected in each of these three states via OSHA. OSHA details standards and safety practices specific to forestry professionals to reduce and prevent the hazards faced by employees working in logging operations throughout the country (OSHA, 1996). There are also federal regulations designed to prevent chemical and biological pollution at logging sites. Waste handling is governed by federal legislation under the Resource Conservation and Recovery Act (RCRA). The control of noxious weeds is mandated at the federal level by The Federal Noxious Weed Act of 1974. Notably, state BMPs, state regulations, and common practices of the forestry industry in the Southeast US uphold similar standards for waste clean-up, chemical applications, sterilization of logging equipment, and other measures to prevent the spread of disease and noxious weeds. These common practices and regulations are also reinforced by certification standards and registration requirements for forestry and logging professionals in each of these three states, which often require professionally trained and certified foresters and loggers.

Map 1: Risk-Based Approach Project Area – Georgia, South Carolina, North Florida
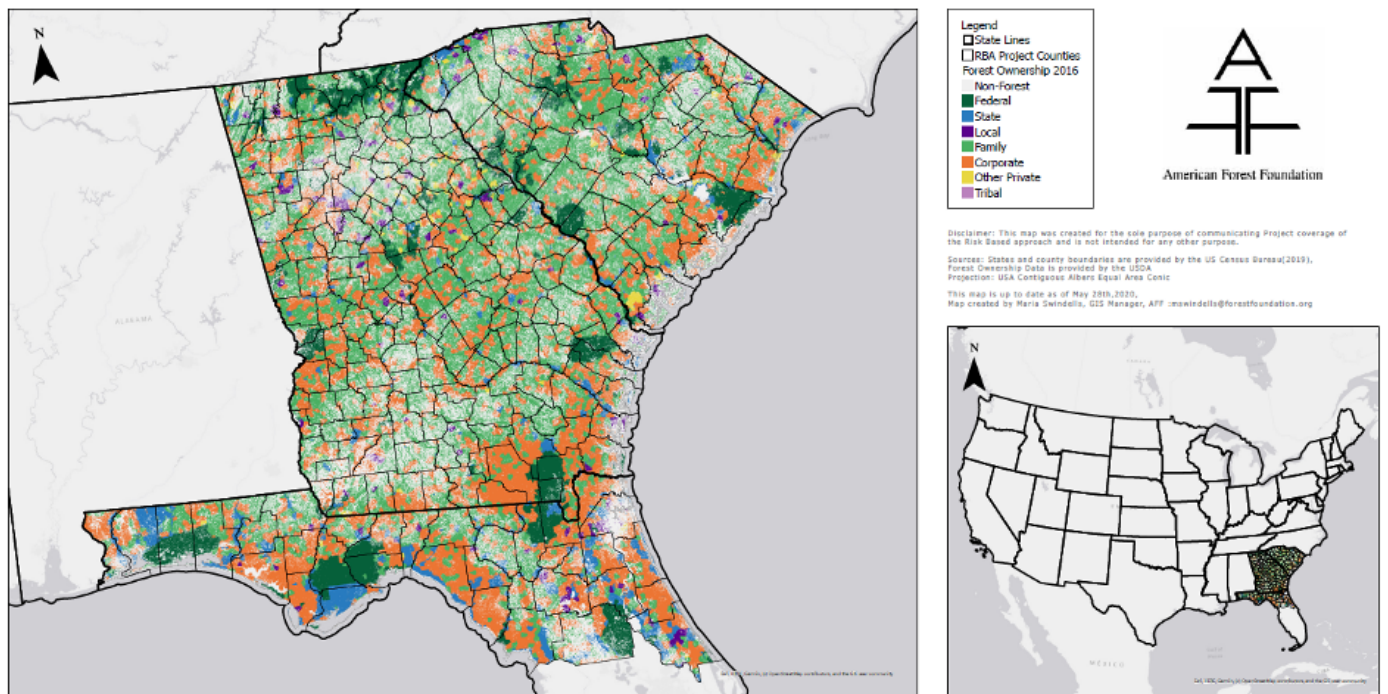
GEOGRAPHIC AND ECOLOGICAL EXTENT

The diversity that exists in forests across the Southeastern US is part of what makes this region so incredibly valuable. This diversity is managed at a local level by foresters who work on the ground with individual landowners. However, biological systems and communities can be identified at a landscape-level and inform management at higher, regional scales. Some of these characteristics, which help define our geographic scope, are described below.

ECOLOGICAL CHARACTERISTICS

The landscapes within our geographic scope share similar interacting biotic and abiotic characteristics and functions. The World Wildlife Fund (WWF) recognizes 14 major habitat types around the world, also referred to as biomes. A biome is a distinct biological community that is formed in response to shared characteristics in climate, geology, and evolutionary history. Our geographic scope falls across two temperate forest biomes: temperate broadleaf and mixed forests and temperate coniferous forests. Within these biomes, forests can be grouped into one of two ecoregions (which are subsets of biomes): Southeastern mixed forests and Southeastern conifer forests (Olsen, 2001).

The forests in our geographic scope exist under temperate climatic regimes, with warm summers, cool winters, and periods of heavy rainfall. This leads to high growth rates and great species diversity of flora and fauna. According to WWF, temperate conifer forests can sustain the highest levels of biomass in any terrestrial ecosystem, and the level of biodiversity is "virtually unparalleled" in North America. The habitats found in temperate conifer forests include longleaf pine forests, pine savannas, flatwood habitats (pine forests with woody understories), and xeric (commonly oak-hickory-pine) and bottomland hardwood communities (e.g., evergreen oaks, bald cypress, black tupelo). Low-intensity frequent fire regimes largely determine the areal extent of these communities; high frequency, low-intensity fire regimes favor the maintenance of longleaf pine and wiregrass communities. (E. Dinerstein, n.d.) Although longleaf pine once dominated this landscape, fire suppression and conversion to southern pine plantations have generated large areas of loblolly and slash pine plantations and areas of mixed hardwood encroachment.

The Southeastern conifer forests are demarcated from the Southeastern mixed forests primarily by elevation (the fall line of the Atlantic piedmont). Although these two forest types overlap in many ways, including species and habitat types, Southeastern coniferous forests are dominated more by longleaf pine, while mixed forests are dominated by oaks. The natural vegetation of Southeastern mixed forests is dominated by oak-hickory-pine and may include stands of pure pine (including longleaf, shortleaf, and loblolly) and pure hardwood. Similar to Southeastern coniferous forests, fire disturbance drives the distribution of ecological communities and enables pine and oak regeneration by providing a control for competing understory plants and hardwoods. Also, like the Southeastern coniferous forests, the mixed forests in this region have been altered from their historical characteristics by fire suppression and conversion to plantations and/or non-forest uses such as agriculture. (A. Weakley et al., n.d.) These similarities lead to shared management objectives and coordinated efforts (described in more detail below).

PHYSIOGRAPHIC PROVINCE

Geomorphic, or physiographic, regions are broad-scale subdivisions of areas having common topography, rock types and structure, and geologic and geomorphic history. For this assessment, the divisions provided by the United States Geological Survey were examined, which are based on Fenneman's "Physical Divisions of the United States." Physiographic divisions have significance for this assessment in that they highlight the relationship of biotic and abiotic characteristics of the region and further support the homogeneity of this scope, especially from a management perspective.

The geographic scope for this assessment is encompassed almost entirely by the Southeastern Coastal Plains and, further inland, the Piedmont physiographic provinces (See Map #2). A small portion of northwest Georgia reaches into the Appalachian Plateaus Province as well. However, this area makes up a very small portion of our geographic scope. The Coastal Plains are characterized by very low relief and relatively flat topography, with gentle sloping terraces draining toward the Atlantic Ocean. Soils are a mix of crystalline carbonate rocks, sand, clay, silt, and gravel in South Carolina. Moving south in this region, toward Georgia and Florida, soils are mixed as well and tend to consist of limestone, clay, sand, and sedimentary deposits1. Soils in the Coastal Plains tend to be poorly drained, and swampy areas are common. However, there are also areas of higher fertility further inland, supporting a heavy agriculture industry. The Piedmont province is also characterized by relatively low relief, with gently rolling topography. The bedrock is deeply weathered, and decomposed rock material (Saprotlite) is present in much of the soils, along with high clay content. Piedmont soils are also moderately fertile. The shared characteristics of relatively flat topography, mixed soils with moderately high fertility, and temperate climate patterns interact across the Piedmont and Coastal Plains, and influence approaches to BMPs and forest management, and are evidence of the homogeneity of this region. This is because soil type, drainages, and slope are all factors that inform approaches to BMPs and affect species/habitat distribution as well.

Map 2: Ecoregion and Physiographic Province – Georgia, South Carolina, and North Florida
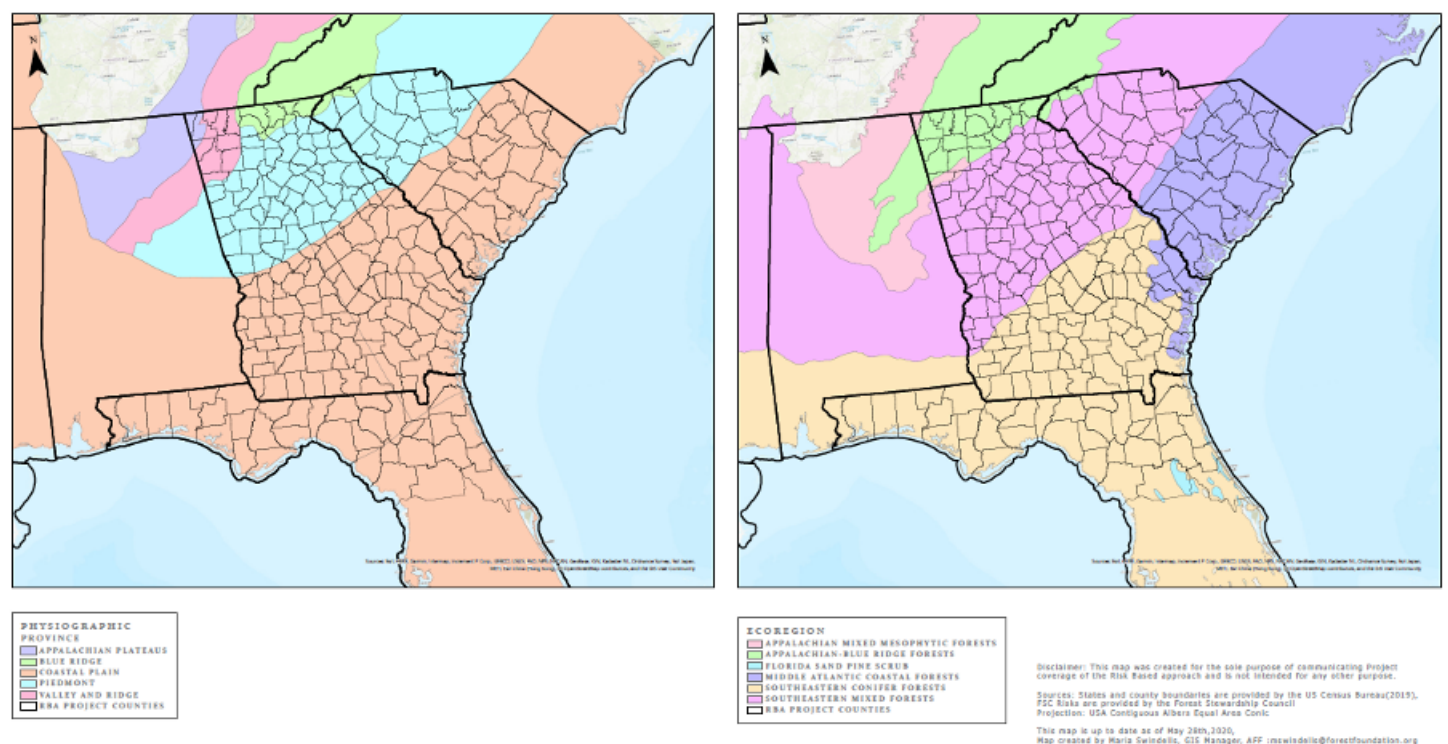
FUNCTIONAL CHARACTERISTICS AND SHARED MANAGEMENT GOALS

From a functional standpoint, biomass sourcing regions are the first level of geographic framing for this scope. The Southeastern states of Florida, Georgia, and South Carolina are part of a critical forest region for the United States, both ecologically and economically. Although this geographic scope focuses on three Southeastern states, the ownership trends evident in these states are also apparent across the southeast and share a common theme in terms of historical and current land use and management. The forests of the Southeast United States are widely recognized for their high biodiversity. Much of the region is working forestland, and the South as a whole produces more sawtimber than any other region of the country (Wear, 2013). Private landowners make up a significant part of ownership in this region. According to the US Forest Service Forest Inventory and Analysis (FIA) National Woodland Owner Survey (NWOS), the family forest ownerships comprise roughly 49% of the forested land base in the Southeastern US, though this proportion can be as high as 90% in some of the counties within the geographic scope. The median holding size in this region is 25 acres for ownerships with at least 10 acres. (Butler et al., 2018)

The management goals of natural resource professionals in this geographic scope also share similar objectives in aiming to conserve and restore important habitat types. Forests in this geographic scope have been significantly affected by a history of fire suppression, agricultural conversion, unsustainable logging, and urban development. One of the primary concerns in this region centers around longleaf pine habitat restoration, and more broadly, returning low-intensity fire disturbance to the landscape via prescribed burning. As well, conservation measures across this region aim to prevent further fragmentation of intact habitat and to restore longleaf and mature mixed hardwood forests in areas that have been converted to plantations or non-forested use. Practices being implemented to this end include planting, selective harvesting, invasive weed management, and prescribed burning. There are also regionwide efforts to get more landowners engaged and connected with conservation work in the region by increasing access to professional foresters and facilitating enrollment in certification programs, including SFI, FSC, and ATFS. Major collaborative efforts are now underway across the region to restore the longleaf ecosystem. The FSC CW NRA identifies Native Longleaf Pine ecosystems, along with Bottomland Hardwood Areas, as the most widespread risk areas that present themselves across our geographic scope (see Map #3).

Map 3: FSC specified risks in the geographic scope of RBA
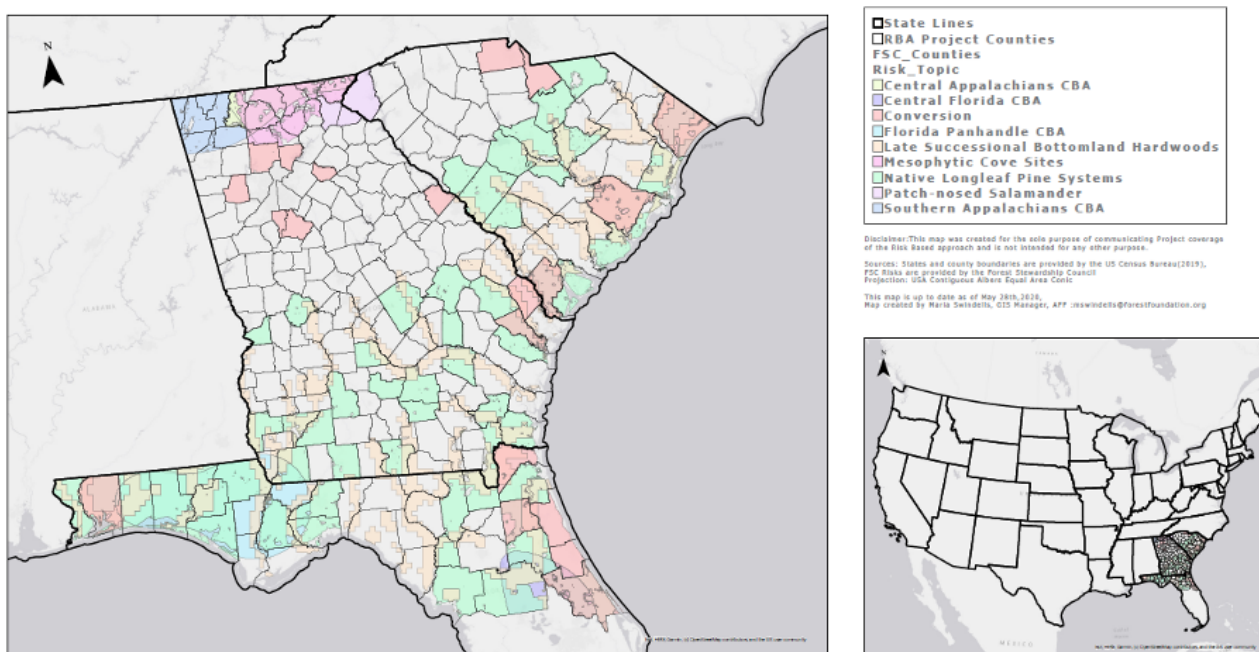
CONCLUSION

The determination of this region, as required by the Verification Protocol, is supported by various interacting, shared characteristics. These characteristics exist on multiple scales. The interaction of these characteristics leads to a level of relative homogeneity with regard to management practices, land use, risk areas, and other factors relevant to this RBA. Based on the characteristics discussed above, the scale and extent of the area under assessment makes practical sense and is appropriate for this RBA.

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- https://www.fs.fed.us/pnw/sciencef/scifi152.pdf
- Forest Stewardship Council National Risk Assessment US: https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra
- See also: section 8.3 of this RBA- sources consulted in 8.3 were additionally reviewed and used in support of the geographic scope.

GATHERING INFORMATION IN RELATION TO THE SFM REQUIREMENTS

DOCUMENTS AND DATA SOURCES

AFF's RBA process steps include gathering information on the specified geographic region that is relevant for risk analysis with respect to the sustainable forest management requirements.

Documents and data sources referenced in the formulation of the RBA include but are not limited to:
- Laws and regulations
- Government statistics
- Datasets and reports compiled by local, state, and federal governments, NGOs, academic institutions, trade organizations, and others
- Expert studies
- Maps
- Stakeholder, practitioner, and expert interviews

All reference documents include appropriate citations and references so that they can be verified by the Conformity Assessment Body (CAB) and other external parties, if appropriate.

EVALUATION CRITERIA AND PROCESS

Recognizing the diversity of datasets used in the development of an RBA, the following criteria were developed to support data selection. Each data set has been evaluated by these criteria. However, these criteria also recognize necessary tradeoffs inherent in analyses and the development of complex approaches. As such, some documents and data sources essential to the RBA may not meet all these criteria but are the best available and the most relevant, given cost constraints or resolution needs.

- Relevance to the sustainability requirement
- Date of data collection or the latest update
  - Preference is given to the sources that are most recent and can be updated. However, some sources will be intentionally dated or older to respond to time-specific criteria in the SDE+ requirements.
- Credibility and independence of the source
- The scale of availability relative to requirements
- Coverage, relative to the region of interest
- Confidentiality constraints
  - This may include the ability to utilize datasets that cannot be further shared to protect the confidentiality of specific individual landowner privacy. This is often the case with AFF's data, as well as family woodland owner datasets provided by the USDA Forest Service, which limit their use or application. It may be the case that alternative data sources are chosen due to confidentiality concerns with a first choice. Some data sources, especially data provided by stakeholders, may require anonymization.

- Licensing or permission or limitations to use
  - Several data sources used in the formulation of the RBA have specific licensing and use requirements. This may contribute to the selection of alternative datasets or limit replication or shareability.
- Cost
  - Preference is given for data that is freely available or low cost. Often, finer-scale data is costly in the context of available funding, and, thus, alternative datasets may be utilized to demonstrate conformance.

CONSULTATION OF STAKEHOLDERS AND EXPERTS

The consultation with stakeholders and experts is essential to the development of the RBA. Stakeholders are also an important source of data in the formulation of the risk assessment. To identify potential stakeholders, AFF conducted an assessment of sectors, organizations, and individuals that may have an interest in decisions or activities undertaken in association with the various elements of this RBA. Representatives of these groups were targeted for inclusion in AFF's outreach for outreach relative to the consultation. AFF has also deliberately targeted stakeholders and special interest groups considered most likely to be impacted by the implementation of the RBA. Relevant stakeholder lists provided by external sources were also incorporated into the RBA consultation, as appropriate. Additionally, after carefully reviewing the range of issues addressed in the SDE sustainability requirements, AFF identified specific areas of expertise required to conduct a robust risk assessment of all applicable sustainability criteria and consulted with corresponding subject area experts. Examples of these stakeholders include the following environmental, social, and economic actors:

- NGOs
- family forest landowners
- foresters and other resource management practitioners
- local communities
- all Federally recognized Native American Tribes located within the RBA region
- workers or unions
- governments
- pellet producers
- associations
- qualified and independent experts

RESPONSIBILITIES FOR THE STAKEHOLDER CONSULTATION PROCESS:

In the development of an RBA for SC, FL, and GA, AFF is responsible for conducting stakeholder consultation to inform the risk assessment. However, if pellet producers use elements of this RBA, they may undertake additional stakeholder engagement.

STAGES OF STAKEHOLDER CONSULTATION

Drawing on the requirements set forth in the Dutch SDE+ and Verification Protocol requirements, the Stakeholder Consultation process supporting the development of the RBA included the following essential steps:

1. Identification of stakeholders and development of the stakeholder contact list, drawing on the list of potential interested or affected stakeholders outlined above.

Note: Wherever possible, existing stakeholder consultation lists complied to support the development of Forest Action Plans within the identified regions have been leveraged for this process. For example, the Georgia Forestry Commission (GFC) worked with key partners and stakeholders to develop Georgia's Forest Assessment & Strategy. A listing of these organizations is available at https://gatrees.org/forest-management-conservation/georgias-forest-action-plan/.

2. Notification of stakeholders and invitation of stakeholder comments in a proactive way with enough time provided to respond:
   a. Identified stakeholders were contacted using various communication modes to inform them of the RBA process and to gather perspectives on issues relating to SDE+ SFM requirements specific to family forest lands in the geographic region of interest.
   b. The primary stakeholder consultation activity involved email distribution of a web-based questionnaire to over 23,000 individuals and organizations in May 2020. The questionnaire was available for submitting comments and input for a period of one month (30 days) to allow stakeholders sufficient time to respond
   c. Results from stakeholder consultation were used to inform the risk assessment, mitigation measures, and to identify issues of concern that may require special attention and/or additional expertise.
   d. Documentation of engagement with stakeholders was made, including copies of emails or letters distributed, summaries of verbal communications with key stakeholders and groups.
   e. Results from the stakeholder questionnaire have been documented in a summary report and will be provided to the Conformity Assessment Body in advance of a verification audit as part of the RBA documentation.
3. Consultation of qualified and independent experts where specialized knowledge is required
   a. Qualified and independent experts were included within the stakeholder list and included in the notification and invitation for feedback.
   b. Qualified and independent experts were also directly contacted, as needed, throughout the development of the RBA based on subject matter expertise.
4. Retention of comments and responses
   a. Summaries of contributions and comments from stakeholders and experts, including reactions and measures taken in response, have been documented and are retained by AFF. As noted above, the Conformity Assessment Body will have access to this information during the verification process.
5. Public availability of RBA results
   a. AFF shall make the results of the RBA (risk assessment and mitigating measures taken) publicly available in summary form as part of the stakeholder consultation. This may occur by posting the results online or posting a statement online, indicating that the RBA results are available upon request. Relevant comments or additional information provided by stakeholders is welcome and will be considered in ongoing monitoring and revision of the RBA.

STAKEHOLDER CONSULTATION BY THE CONFORMITY ASSESSMENT BODY

During verification, the BP shows the Conformity Assessment Body (CAB) the RBA results. As part of the verification, the CAB needs to consult relevant stakeholders. Which stakeholders are to be consulted depends on the information in the risk assessment and is up to the verification team's professional judgment. When applying an RBA for small FMUs, the BP must keep an administration in which the FMUs from which biomass is sourced are registered, showing that they each cover less than 500 hectares or 1,235 acres.

SUMMARY

As part of the risk assessment (and broader RBA) process, AFF has conducted a comprehensive stakeholder consultation process to ensure that key stakeholders' rights and opinions are considered and to allow stakeholders to contribute to the RBA process. **Results** of the RBA (risk assessment and mitigating measures taken) are made publicly available as part of the stakeholder consultation, and relevant stakeholder comments received by AFF will be considered in future revisions to the RBA. **A report**, including the contributions and comments from stakeholders and experts, including reactions and measures taken in response, has been compiled and included in the final RBA. Results from stakeholder consultations have also been referenced in the RBA as part of Indicator-level risk assessments, as appropriate.

DETAILED STAKEHOLDER CONSULTATION PROCEDURE AND KEY STEPS:

1. Stakeholders were contacted directly by email or telephone to inform them of the project and what they could expect. All feedback has been collected and documented.
2. Stakeholders were invited to submit any comments or input via email in May 2020 with a link to an online survey containing a list of questions (see Annex I) to serve as guidance. Stakeholders were given 30 days to respond to the questionnaire.
3. Information sent to stakeholders for consultation included the following:
   a. A brief description, including a direct reference and link to the Dutch SDE+ sustainability standards;
   b. A brief description of the purpose of the RBA, the scope of the risk assessment, and the objective of stakeholder consultation, including a request for comments;
   c. The start and end dates of the stakeholder consultation period;
   d. A Point of Contact should stakeholders have questions;
   e. A statement that comments will be not be published; and
   f. A statement that the RBA development process is aligned with this Verification Protocol RBA Procedure.
4. Upon the close of the consultation period, AFF staff ensured proper collection and documentation of comments.
5. AFF staff members or subject matter experts have reviewed all comments by stakeholders and incorporated them as appropriate in the final draft RBA report.
6. AFF has responded to all stakeholders who participated in the consultation process and explained how their comments were taken into account.
7. AFF has a formal procedure in place for the investigation and resolution of complaints and appeals that are available to stakeholders.
8. AFF has prepared a stakeholder consultation report which includes:
   a. A summary of the issues raised and how they were addressed;
   b. An analysis of the range of stakeholder groups who submitted comments; and
   c. An unedited copy of all comments received (stakeholder identities redacted as appropriate) as an Annex to the report.
9. The stakeholder consultation summary report has been appended in its entirety to the final draft RRA report.

RISK ASSESSMENT

RISK ASSESSMENT METHODOLOGY

AFF conducted a thorough assessment of each of the sustainability indicators that apply to Category 2, in accordance with the directions outlined in Chapter 8 of the SDE+ Verification Protocol. The VP establishes that criterion level conformance is determined by and reliant upon demonstrated conformance with each corresponding indicator. The information assessed for each indicator was collected according to the RBA's information gathering process.

As described in Annex II, Stakeholder Consultation Results and Summary, input received from interested stakeholders and experts has been an essential source of information for the development of the RBA's risk assessment. Stakeholder feedback was generated via more than 300 responses to a questionnaire provided information relevant to sustainable forest management (SFM) criteria specified in the SDE+ Verification protocol. Eighty-nine stakeholders responding to the questionnaire distributed by AFF in May 2020 indicated an interest in one or more of the three states located within the RBA region (FL, GA, SC). The responses to the questionnaire are summarized in Annex II and embedded within the findings for corresponding indicators within the risk assessment. In most instances, stakeholder feedback supported analyses and conclusions. In a few cases, feedback identified potential weaknesses and led to more rigorous due diligence and/or the need for mitigation.

An evaluation method was identified for each criterion. Recognizing the complexity of many of the sustainability elements addressed in the SDE+ requirements and the multiple variables that influence performance, where feasible, AFF sought to include both quantitative and qualitative analyses, to yield the most robust conclusion.

Analyses were conducted by qualified professionals with relevant experience and expertise to ensure the credibility of the RBA overall. Secondary reviews of the entire RBA were also conducted by SCS Global Services and Peterson to provide additional as to the quality of the risk assessment, mitigation and broader RBA framework. For a description of SCS Global, see Annex III.

SCALE OF ANALYSIS AND APPLICATION OF THE RBA

The RBA's objective is supporting a comprehensive assurance system for roundwood sourced from Category 2 lands (forest management units of 500 hectares or smaller). To this end, the risk assessment was undertaken to produce regional results for application at the pellet's producer's roundwood supply basin level. However, AFF utilized fine-scale data and analyses within the assessment to allow for visibility at a granular level, where possible, which could support trend detection and monitoring overtime. Because data and results of analyses are more statistically viable and reliable at a larger scale, we used this as a guiding principle.

Data, both quantitative and qualitative, used in evaluating the risk associated with each indicator, were available at various scales and in various forms. For consistency, we sought to acquire and analyze county-level data. However, because of the inherent errors resulting from small sample sizes, irregular distribution of samples, and variation in county sizes and shapes, this RBA does not, generally, mobilize county-level results to characterize risk at the county level unless clearly stated and justified. Users of the RBA should, likewise, not do so.

In other circumstances, analyses were conducted at scales appropriate to the specific source and, where necessary, extrapolated or adapted to generate a conclusion at the regional scale. Such extrapolations are transparently noted in the methodology and/or considerations and disclaimer sections for relevant criteria.

DATA AND ANALYTICAL LIMITATIONS

It is important to note that data about family-owned forests specifically is often not available due to the diffuse and scattered nature of the ownership class as well as statistical challenges, privacy concerns, and other factors. Where it is available, there may be other limitations. For example, FIA datasets for family woodlands often carry approximately a 65% accuracy rate at the county scale. However, there is widespread consensus that FIA is the highest quality raster data available and is especially well suited to supporting trend analysis because of the consistency of methodology over time, uniform distribution, and the scale of the census. As such, AFF is utilizing FIA as the best available data, deriving estimates for family woodlands and developing results at a state level, while also leveraging information about the extent, nature, operations, and behaviors associated with family ownerships to determine risk designations. These considerations are identified, where they apply, for each criterion and indicator, where appropriate.

Similarly, in several cases, studies and data about trends in the sector, such as harvesting of stumps, and/or practices related to specific land features, such as wetlands, are available at a south-wide regional level but not at a state or finer scale. In these cases, the available data was applied if it is qualitatively appropriate, there appeared to be consensus in multiple sources and/or stakeholder and expert feedback supported such attribution.

RISK ASSESSMENT

In accordance with section 8.3.2 of the Verification Protocol, the risk of non-compliance for each requirement applying to Category 2 is expressed as "low risk" or "specified risk" based on the analyses conducted and the indicators set out in the protocol. For each of the indicators, a rationale for risk designation is provided, drawing on the analyses conducted. As a result, for indicators with specified risk, the related criterion is also designated with specified risk aligning with the VP's requirement that compliance with criteria is dependent on compliance with all applicable underlying indictors.

As defined in the Verification Protocol, "low risk is identified when there are clear indications that the chance of non-compliance with the relevant sustainability criterion in combination with the consequences is small and the risk analysis has yielded no information that leads to a specified risk designation".

As further defined in the Verification Protocol, "Specified risk" "is identified when there is not enough information for the risk assessment to establish whether the risk is low or when the mitigating measures are not sufficiently effective in reducing the chance that identified risks materialize or in reducing the consequences of such risks. In case of doubts, a precautionary approach shall be applied". As a result of the characteristics and locations of resource values, as well as the level of detail available for those resource values, "specified risks" for this RBA are generally identified for specific geographic areas. As outlined in the mitigation section, for criteria with specified risk designations, mitigation must be implemented, consistent with the enumerated guidelines.

DETAILED FINDINGS (ASSESSMENT OF RISK OF NON-COMPLIANCE AND EXPRESSION OF RISK FOR EACH SFM CRITERION)

PRINCIPLE 3: PRODUCTION OF RAW BIOMASS DOES NOT RESULT IN THE DESTRUCTION OF CARBON SINKS

CRITERION 3.1 Biomass is not sourced from permanently drained land that was classified as peatland on 1 January 2008, unless it can be demonstrated that the production and harvesting of the biomass does not result in water depletion of a previously undrained soil.

INDICATOR 3.1.1 The economic operator shall demonstrate that the biomass is not sourced from permanently drained land that was classified as peatland on 1 January 2008, unless Indicator 3.1.2 applies.

INDICATOR 3.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:
Geospatial change detection analyses, comparing the National Land Cover Data (NLCD), from 2008 to 2016 (most recent available). 2008 and 2016 wetland values of 90 and 95 (NLCD classifications for "woody wetlands" and "emerging herbaceous wetlands") were compared and where 2008 wetland values were not equal to 90 or 95 in 2016, wetland conversion likely occurred.

To identify wetland conversion, total wetlands were summarized for both years, the results are below, showing the difference in total wetlands. This results in less than 1% change in wetlands conversion from 2008. A second method was used to only look at where wetlands existed in 2008, and were converted to other land cover types, almost identical results were produced.

Qualitative analyses included review of relevant literature, consultation with wetland experts, forest practitioners and other stakeholders.

EVALUATION OF COMPLIANCE:
While precise locations of peat lands are not well documented, review of major clearinghouses and programs dedicated to peatland highlight the largest known concentrations of peatland are in Canada and Alaska, Northern Europe and Western Siberia, Southeast Asia, and parts of the Amazon and Congo basins, where more than 10% of the land area is covered with peatlands. These are the peatlands that are generally identified in association with major carbon sinks globally. (Zu, et al. 2010; Yu, 2017; International Peatlands Society; UNDP, et al. 2020) Consultation with experts suggests that the extent of peatland is limited in the RBA region.

Peatlands, within the geographic scope of the RBA, tend to be associated with histosol soils, which meet the definition for "peatland" identified in the Dutch criteria. According to the USDA Illustrated Guide to Soil Taxonomy V2.0, 2015, "histosols are formed in thick accumulations of organic matter from decaying plant material. The organic-dominated layers are typically at least 40 cm thick and commonly much thicker" and, as such comply with the SDE+ definition for wetlands. Further, review of the literature and consultation with experts confirmed that peatlands are terrestrial wetland ecosystems. As a subset of wetlands, the analyses completed for 3.2.1 would apply to peatlands. (USFWS, 1979)

To ascertain loss in wetlands, inclusive of peatland, after the benchmark year of 2008, we conducted an analysis of the National Land Cover Database (NLCD, 30m resolution) from 2008 and 2016 (latest available data) for change in all wetlands (including woody wetlands with 20% or more vegetative cover or emergent herbaceous wetlands with 80% herbaceous cover and the soil or substrate is periodically saturated with or covered by water). The foundational reference for NLCD's wetland cover types, Classification of Wetlands and Deepwater Habitats of the United States, includes peatlands in the scope of wetlands.

Our geospatial analyses found minimal conversion during this period, less than 1% conversion of wetlands, between 2008 and 2016, across the three-state geography, and within each of the states. See Risk Assessment Table I:

Risk Assessment Table I: Change in wetland area within the RBA region, 2008 to 2016.

State	Wetland Area (Ac.)		Change in Wetland Area 2008 to 2016	
	2016	2008	Acres	Percent
Florida Project Area	5,180,428	5,204,009	-23,581	-0.45%
Georgia	6,538,731	6,562,206	-23,475	-0.36%
South Carolina	4,492,460	4,530,581	-38,121	-0.84%
TOTAL	16,211,619	16,296,796	-85,177	-0.52%

Additionally, we considered land use history and the impacts of implementation and enforcement of the Clean Water Act (CWA). Section 404 allows normal, ongoing silviculture but specifies that road building and maintenance must adhere to specific Best Management Practices (BMPs). This section also specifically regulates the discharge of dredged or fill material and specifies activities must not convert wetlands to uplands and/or new uses. (EPA, 2020) The active enforcement of this law suggests conversion of any wetland to dried alternative ecosystems is likely to have occurred before its enactment in 1972. In the early twentieth century, wetland drainage was encouraged and, in some circumstances, subsidized, to promote the expansion of agriculture and plantation forestry across the South. Experts consulted likewise report most wetland conversion occurred in the 1940s and 1950s and, particularly, dredging of wetland areas was greatly reduced following passage of CWA in 1972, further reducing the likelihood of wetland conversion since January 1, 2008. In addition, experts consulted indicated that, in this region, peatlands would have been drained first through agricultural conversion (1800-early 1900's), and some forested peatlands were drained for forest products during the mid-1900's to early 1980's, before the reference year of 2008.

As required by the CWA, implementation and enforcement BMPs at the state level would significantly reduce the risk of the sourcing of biomass from wetlands, especially from those converted since January 1, 2008. Experts and stakeholders note that, while there is little new silvicultural drainage, some trees are grown in existing ditches and canals. These water features are heavily regulated, and drainage is not an issue that comes up regularly in forest management. Overall, silvicultural operations in forested wetlands are compatible with long-term sustainability when appropriate silvicultural systems, forest operations, and forestry [Best Management Practices](BMPs) are applied (Aust, et al. 2019, pp29).

Finally, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (NWOS, Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely to protect water resources or features if present on their properties.

In conclusion, taken together, our analyses show the risk of biomass production and harvesting from permanently drained land that was classified as peatland before 2008 is low for the following reasons:
1. NLCD data show historic drainage of peatlands from 2008 to 2016 is extremely low, in total below 1%; and,
2. Consultation with experts and stakeholders, review of pertinent literature, and the 2018 NWOS results show that drainage of peatlands is not likely to occur, given protective legislation by the CWA, a high degree of BMP implementation and landowner attitudes toward protection of water quality.

DISCLAIMERS AND CONSIDERATIONS:
1. NLCD data is best available data but only current to 2016 and does not account for more recent land changes. The exact date data was recorded in 2008 of the NLCD is not clear. However, it is reasonable to assume data collection occurred throughout 2008. It is possible that there may be undetected wetland loss occurring during the course 2008. However, this risk is marginal, especially considering other dimensions of our analysis.
2. NLCD is the best freely available data for landcover change over time, and at 30 m resolution, there is an assumption that these areas are subject to error.
3. Geospatial analyses apply to all lands. This analysis assumes that wetlands are not more or less likely to occur on family woodlands, though anecdotally one stakeholder reported private lands generally tend to be lower in elevation and federal lands tend to be higher.
4. The 2018 National Woodland Owner Survey (NWOS) results are the most recent available and are so recent they are currently in final stages of review by US Forest Service officials. NWOS results reviewed include all size classes in the family/individual category. The NWOS lead researcher indicated that results would likely be marginally differently if larger size classes were excluded, but that larger land classes tend to be associated with greater levels of engagement and forest management activities.
5. There are other data sources that are good sources for data on soils and wetlands, such as the Harmonized World Soil Database, as well as SSURGO, maintained by the USGS. However, experts report that these resources cannot support change detection or be practically used for the scale of these analyses.

INDICATOR 3.1.2 If Indicator 3.1.1 cannot be fulfilled, the economic operator shall demonstrate that the production and harvesting of the biomass does not result in water depletion of a previously undrained soil.

INDICATOR 3.1.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY:

See Assessment Methodology for Indicator 3.1.1

EVALUATION OF COMPLIANCE:

Fulfillment at 3.1.1 level

CRITERION 3.2 Biomass is not sourced from land that was converted from a wetland to an alternative, dryer ecosystem after 1 January 2008.

INDICATOR 3.2.1 The economic operator shall demonstrate that the biomass is not sourced from land that was converted from wetland to an alternative (dryer) ecosystem after 1 January 2008.

INDICATOR 3.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY:

Geospatial change detection analyses, comparing the National Land Cover Data (NLCD), from 2008 to 2016 (most recent available). Wetland values of 90 and 95 were compared and where 2006 wetland values were not equal to 90 or 95, wetland conversion likely occurred.

To identify wetland conversion, total wetlands were summarized for both years, the results are below, showing the difference total wetlands. This results in less than 1% change in wetlands conversion from 2008. A second method was used to only look at where wetlands existed in 2008, and were converted to other land cover types, almost identical results were produced.

Qualitative analyses included review of relevant literature, consultation with wetland experts, forest practitioners and other stakeholders.

EVALUATION OF COMPLIANCE:

To ascertain loss in wetlands, inclusive of peatland, after the benchmark year of 2008, we conducted an analysis of the National Land Cover Data (NLCD, 30m resolution) from 2008 and 2016 (latest available data) for change in all wetlands (including woody wetlands with 20% or more vegetative cover or emergent herbaceous wetlands with 80% herbaceous cover and the soil or substrate is periodically saturated with or covered by water. The foundational reference for NLCD's for wetland cover types, Classification of Wetlands and Deepwater Habitats of the United States was reviewed for relevance to the SDE+ definitions.

Our geospatial analyses found minimal conversion during this period, less than 1% conversion of wetlands, generally, between 2008 and 2016, across the three-state geography, and within each of the states.

Additionally, we considered land use history and the impacts of implementation and enforcement of the Clean Water Act (CWA). Section 404 of the CWA allows normal, ongoing silviculture but specifies that road building and maintenance must adhere to specific Best Management Practices (BMPs). This section also specifically regulates the discharge of dredged or fill material and specifies activities must not convert wetlands to uplands and/or new uses. (EPA, 2020) The active enforcement of this law suggests conversion of any wetland to dried alternative ecosystems is likely to have occurred before its enactment in 1972. In the early twentieth century, wetland drainage was encouraged and, in some circumstances, subsidized, to promote the expansion of agriculture and plantation forestry across the South. Experts consulted likewise report most wetland conversion occurred in the 1940s and 1950s and, particularly, dredging of wetland areas was greatly reduced following passage of CWA in 1972, further reducing likelihood of wetland conversion after January 1, 2008. In addition, experts consulted indicated that, in this region, peatlands would have been drained first through agricultural conversion (1800-early 1900's), and some forested peatlands were drained for forest products during the mid-1900's to early 1980's, before the reference year of 2008.

Additionally, as required by the CWA, implementation, and enforcement of BMPs at the state level, would additionally significantly reduce the risk of the sourcing biomass from wetlands, generally, but especially from those converted after January 1, 2008. Experts and stakeholders note that, while there is little new silvicultural drainage, some trees are grown in existing ditches and canals. These water features are heavily regulated, and drainage is not an issue that comes up regularly in forest management. Overall, silvicultural operations in forested wetlands are compatible with long-term sustainability when appropriate silvicultural systems, forest operations, and forestry Best Management Practices are applied (Aust, et al. 2019, pp29).

Finally, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (NWOS, Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

In conclusion, our analyses, taken together, but especially because wetland conversion in this region largely predates 2008 and there is very limited change in wetland extent in the period since, the risk of biomass production and harvesting resulting in the depletion of a previously undrained soil is characterized as low.

DISCLAIMERS AND CONSIDERATIONS:

1. NLCD data is best available data but only current to 2016 and does not account for more recent land changes.
2. NLCD is the best freely available data for landcover change over time, and at 30 m resolution, there is an assumption that these areas are subject to error.
3. Geospatial analyses apply to all lands. This analysis assumes that wetlands are not more or less likely to occur on family woodlands, though anecdotally one stakeholder reported private lands generally tend to be lower in elevation and federal lands tend to be higher.
4. The 2018 National Woodland Owner Survey (NWOS) Results are the most recent available and are so recent they are currently in final stages of review by US Forest Service officials. NWOS results reviewed include all size classes in the family/individual category. The NWOS lead researcher indicated that results would likely be marginally differently if larger size classes were excluded, but that larger land classes tend to be associated with greater levels of engagement and forest management activities.
5. There are other data sources that are good sources for data on soils and wetlands, such as the Harmonized World Soil Database, as well as SSURGO, maintained by the USGS. However, experts report that these resources cannot support change detection or be practically used for this scale of analyses.

CRITERION 3.3 **Biomass is not sourced from wood plantations that were created by means of conversion of natural forests after 31 December 1997, unless the forest manager is not directly or indirectly responsible for the conversion. Biomass originating from wood plantations that were created after 1997 by means of conversion of degraded natural forests or degraded land is exempt from this requirement on condition that it is ecologically and economically justified to do so and that the forest manager is not directly or indirectly responsible for the degradation.**

Explanatory notes:

Enrichment planting after a clear-cutting within an FMU could be part of SMF of natural forests, depending on the scale and intensity of the FM. This is not considered a conversion of the natural forest into a wood plantation. Comparing two or more types of relevant info (area photos, satellite images, land register documents/certificates, online maps/databases, site surveys, NGO reports, forest management plans) of the situation before and after 31 Jan 1997 is considered an appropriate method for providing clear and sufficient evidence. In the event only one type of relevant info is available for the situation before and after 31 Dec 1997, additional proof is required that may consist of relevant environmental impact reports or reports of consultation with relevant stakeholders that confirm the requirement has been met.

INDICATOR 3.3.1 If biomass originates from wood plantations where conversion has taken place of natural forests, the economic operator shall demonstrate whether this conversion occurred before 31 December 1997.

INDICATOR 3.3.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY:

To assess the risk associated with sourcing from wood plantations created by the conversion of natural forests after 1997, we conducted qualitative analyses of various sources including interviews with experts, practitioners, and stakeholders, as well as reviewed relevant academic literature and reports. In addition, as a secondary measure, we conducted quantitative analyses of the FIA data compiled by Chris Oswalt, as well as Jeff Turner, both of the US Forest Service's Southern Research Station.

One component of the assessment examined occurrence by area (acres) for species groups within the geographic scope of the RBA using FIA data to support risk evaluation based on current extent of nonnative species which would have been planted. We then applied a family forest ratio to further isolate likely occurrence on Category 2 lands. These findings were corroborated with stakeholder and expert interviews. Our analysis demonstrates the overwhelming majority of planted forest stands on Category 2 lands do not qualify as wood plantations, and therefore conversion of natural forests did not occur, because:
1. most planted stands are comprised of native species, not exotic species; and,
2. most planted stands are not managed intensively on Category 2 lands.

A second component of our analysis uses quantitative analyses of FIA data in 5-year intervals between the years 1995 and 2015 to determine the likelihood of sourcing biomass from forests created through planting after 1997. Our analysis shows that the area comprised of planted stands within the RBA region increased by only 5% between 1995 and 2015. Further, the total area of planted stands across all ownerships within the RBA has declined steadily since 2005, indicating the likelihood of sourcing biomass from a plantation is decreasing over time. We also show that the existence of plantations on family forests is disproportionately low relative to other landowner classes, and the practice of intensive management associated with wood plantations is also low.

ASSESSMENT OF COMPLIANCE:

The land use history in the RBA region is defined by repeated cycles of land clearing, conversion to agriculture, reforestation, and repeated timber harvesting. Particularly following the American Civil War and through the end of the second world war, most of the forests in this region were harvested repeatedly, and purposefully reforested with local species, particularly in the 1920s (Volk, et al. 2017; Fox, et al, pp63; Barnett, et al, 2017, pp1-4), 1950s (Chen, et al. 2017) and 1980s (EPA, 2019, pp6-25) (Forest2Market, 2017, pp.42). Similarly, it is estimated that between 1989-1999, 4.5 million acres of stocked timberlands transitioned temporarily to a non-forest use and of these, 94% were naturally regenerated. Thus, in this context where many of the lands in the region have repeatedly cycled between human and natural systems, it is often difficult to identify natural forests, and therefore plantations, given the complexities of the impact of repeated human interventions on ecological processes, (Chen, et al, 2017, pp546).

Despite this complex land use history, to determine the likelihood of sourcing from current wood plantations created after 1997 on Category 2 lands, we first examined the definition of wood plantations. SDE+ defines "wood plantation" as "Forest consisting of trees of similar age of one or a few types of species, exotic species or native species planted or sown in a regular pattern, aimed at wood production." While planted forest stands are not uncommon in this region (see analyses below), two key determining factors for wood plantations, per the SDE+ definition, are: 1) use of introduced species; and 2) intensively managed stands of native species.

To assess the extent of introduced species, we analyzed species occurrence (area) in the FIA data on all ownerships within the selected geography. We isolated the introduced species groups reported in FIA, specifically tropical hardwoods, and exotic hardwoods. Our analyses found that these species groups are reported in only 13 of the 242 counties within the RBA region. In these counties, none register these species groups as more than 2.5% of total forest area. Across the entire RBA region, 49,595 acres are planted with exotic species out of a total of 59,343,174 forested acres representing 0.08% of the total forested area. Furthermore, when the family forestland ratio is applied to these county level data, the area in these non-native species groups drops to below 1% in all counties. Interviews with stakeholders corroborate this finding, consistently stating that it is highly unusual for family forest owners to use exotic species. Thus, as a defining factor for plantations, the use of introduced species is determined to be virtually non-existent on Category 2 lands in this geography and, as a result, of low risk of non-compliance.

The second defining factor provided by SDE+ for wood plantations is "aimed at wood production", which we understand to mean for the primary, if not exclusive, purpose of optimizing net income generation through the commercial production of wood fiber. This management philosophy is commonly referred to as "intensive forestry". As outlined above, nearly all forests in this region are comprised of native species. To provide appropriate context for the practice of "intensive" forestry for family woodlands in the RBA region, we turned to the USDA Forest Service Southern Research Station's web published Glossary of Forest Engineering Terms, which defines "intensive forest management" as "Utilization of a wide variety of silvicultural practices, such as planting, thinning, fertilization, harvesting, and genetic improvement, to increase the capability of the forest to produce fiber."

To determine the extent to which "intensive" management would appropriately be applied to Category 2 lands, we began with a review of FIA's NWOS Results for the Southern Region (Butler, et al. 2020). Intent to "produce fiber" is a driving factor for intensive management. However, only 15% of all family ownerships report that production of timber products is "very important" as a reason for owning their land. We included only "very important" responses because that level of interest is more specifically correlative to a primary purpose for forest management. Given that production interest increases with holding size (Butler, et al. 2020, Southeast, Table 7), landowner interest in intensive management is likely to skew more toward the larger holdings (likely larger than 500 hectares.

Other analyses of forest types, growing stock inventories and harvest levels by ownership show that, despite owning a larger share of forests, family ownerships are not intensively managed as compared to other private timberlands (e.g., TIMO/s, REITs and industry lands) in the southeast US. For example, TIMOs and REITs own 26% of plantations in the region despite owning only 9.6% of all forest lands. Over 60% of the growing stock volume managed by these industrial owners is represented by softwood species, as compared to 27% for family forest lands where most of the growing stock within the same region is represented by hardwoods. Softwood species, particularly loblolly pine and slash pine, are the overwhelming preference for plantations in the southeast US. Further, while all ownership classes show higher growth than removal volumes on all forest types combined, industrial lands have harvested in excess of growth on hardwood types indicating a trend of converting hardwood stands to softwood plantations. This is not the case for family forest lands. Lastly, standing growing stocks per acre are higher on family forest lands than any other ownership class except for public lands, while removal volumes per acre on family forest lands are below the average for all ownership classes. (Zhang, et al. 2012 pp359).

Finally, we engaged a range of experts, including researchers, and foresters, and stakeholders and found consensus that, while there is a small minority of family woodland owners that may intensively manage their woodlands, per the applied definition, the vast majority of family landowners do not. Foresters, in particular, noted that family landowners are less likely to employ the full suite of silvicultural interventions typically associated with intensive forestry, particularly fertilization and genetic improvement. Stakeholders noted that non-intensive management is particularly applicable for landowners with parcels of 500 or fewer hectares, to whom this RBA applies.

In addition, the Dutch Verification Protocol's explanatory notes for Criteria 3.3 indicates that "enrichment planting" of native species after a clear-cut is not considered conversion to a wood plantation, depending on the scale and intensity of forest management. Consultation with experts suggests that replanting (or natural regeneration) of native species is a norm for family landowners, and this practice is consistent with the term "enrichment planting."

Overall, with regard to intensive management of any stands, including those with a uniform age class as the SDE+ definition notes, our research suggests that employment of an intensive style of management by family woodland owners with 500 hectares or less is rather unlikely, and therefore the risk of noncompliance is low. Thus, on a definitional basis, including specifically the use of introduced species and intensive management practices, the risk for sourcing biomass from wood plantations on Category 2 lands is low.

While we feel the above analysis strongly indicates low risk for the overwhelming majority of family landowners with holdings smaller than 500 hectares, to further assess risk of harvesting biomass on wood plantations established after 1997, we conducted additional review of literature, expert engagement and analyses of FIA data.

While remotely sensed data is often cited as a resource for such analyses, due to the difficulty in distinguishing the optical reflectance of plantation forests from naturally regenerated forests, remote sensing products are not currently available to directly identify spatial locations of plantation forests across landscape scales (Chen, et al, 2017, pp 547). The National Land Cover Database (NLCD), which we use elsewhere in assessing risk for this RBA, could not be applied to this assessment because it only dates to 2006 and would not provide adequate coverage relative to the noted reference year. Furthermore, available resources such as WRI's Global Forest Watch are controversial amongst some stakeholders and are also not able to provide time intervals relative to the SDE+ benchmark year of 1997.

To determine the likelihood of sourcing biomass from forests created through planting after 1997, we analyzed FIA data in 5-year intervals between the years 1995 and 2015. 1995 and 2015 are the closest available summaries of the FIA census relative to our reference date of 31 December 1997 and the present. The dataset includes acres of planted and naturally regenerated timberland. The analyses indicated that the percentage of all forests that are planted has roughly averaged between 20-40% in this region and has remained relatively stable over the 20-year period, within a range of 5%. Overall, across the RBA region, our analysis shows 5.2% more planted forests in 2015 than in 1995 and, in Florida, there are currently fewer planted forests now than in 1995. However, the FIA data shows that, at the state level, planted forests on all ownership types, as a subset of all forests, peaked in the 2005 (FL and SC) or 2010 (GA) inventory summaries and decline after that, showing that the area of planted forests within the RBA region is trending downward, reducing risk. At the peak measurement year of 2005, the

total net increase in area of planted forests since 1995 is 1.58 million acres. This net increase in planted area since 1995, which can reasonably be assumed to approximate the area of new planted area since 1995, represents only 3.1% of the total forest area within the RBA. When we further consider that some of this area was likely planted between 1995 and 1997, and that Category 2 lands represent only 49% of the total forest area in the RBA (Butler, et al, 2020), and that family forests hold a disproportionately small portion of planted forests in the southeast US (Zhang, et al, 2012), and that only a portion of this total area of planted stands would be harvested in any single year, the likelihood of sourcing biomass from a stand of trees planted after 1997 is extremely low, and decreasing over time. Recognizing that family forest owners within the RBA region do not use exotic species, and typically do not employ intensive management practices, the area of new planted stands created after 1997 that qualify as "wood plantations" as a result of conversion of natural forests is likely further diminished.

It is important to note that we did not apply a family forest land ratio to these data or results because our research indicates that the area in planted forests is disproportionately weighed toward industrial lands and applying the ownership ratio would likely exaggerate the planted area on family forest lands.

Overall, the SDE+ defined "wood plantations" would constitute a much smaller portion of all the planted forests identified in this analysis because, according to the SDE+ definition, these "wood plantations" would include: 1) use of introduced species, which we found to be extremely limited, overall and, especially amongst family landowners; or, 2) intensive management regimes, i.e. native species planted for the primary, if not exclusive, purpose of optimizing net income generation through the commercial production of wood fiber, which we found to be atypical of family woodlands, especially for holdings smaller than 500 hectares. Hence, particularly when considered alongside the small proportion (15%) of family forest owners who list timber production as a priority for ownership, the area of plantations actually occurring on family forest lands is likely overstated by applying forest ownership ratios for all forested lands.

We note that the FSC National Risk Assessment (NRA) specifies risk for conversion to plantations or non-forest use in a total of 20 counties in the RBA region. The FSC CW NRA applies to all ownerships, while our RBA applies only to Category 2 lands. We have shown that the occurrence of "wood plantations" on family forest lands is considerably less likely than on other ownership classes. It is also important to note that the FSC US CW NRA concluded, like similar analyses (Forest2Market, 2017, pp6), that conversion of natural and semi-natural forests has historically been driven by agricultural expansion, and more recently, by urban development associated with population growth. While the NRA did note that tree plantations are expected to continue to increase in extent in the US, this will most likely occur through afforestation (of non-productive agricultural lands or degraded forest lands), not conversion of existing forests (FSC, 2019, pp170). The risk specified by the CW NRA for the broader issue of conversion of forests to nonforest land use were accepted and expanded upon elsewhere in this RBA. However, based on our own analysis of trends in plantation displacement of natural forests on Category 2, we depart from the CW NRA's wider conclusion regarding risks associated with plantations.

In summary, we have concluded the risk of non-compliance to Indicator 3.1.1 is low for the following reasons:
- Planted forest stands occurring on Category 2 lands FFOs typically do not meet the SDE+ definition of a "wood plantation", and therefore, the likelihood that biomass is sourced from intensively managed wood plantations that were converted from natural forests is very low;
- Most plantations on Category 2 lands were established before the benchmark date of December 31, 1997.

DISCLAIMERS AND CONSIDERATIONS:

- In the quantitative analyses of FIA data, we selected 1995 and 2015 as reference years as they represent the closest available summaries of the FIA census relative to our reference date of 31 December 1997 and the present.
- We did not apply a family forest land ratio to the FIA data or results for planted area within the RBA from 1995 through 2015 because qualitative analysis indicates plantations are more likely to occur on other ownerships (Zhang, et al, 2012).

INDICATOR 3.3.2 If biomass originates from wood plantations where conversion of natural forests has taken place after 31 December 1997, the economic operator shall demonstrate that:

- the forest manager that harvested the biomass was not directly or indirectly responsible for the conversion, or;
- the conversion took place in natural forests that, at the time of conversion, were in a degraded state or of which the soil had degraded, and where the conversion was carried out in an ecologically and economically justifiable manner.

INDICATOR 3.3.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY

See above methodology for Indicator 3.3.1. Additionally, we consulted the results of the FSC US Controlled Wood National Risk Assessment regarding the risk of conversion of natural forests and researched the impacts on establishment of planted forests stemming from federal policies such as the Soil Bank Program and the Conservation Reserve Program.

ASSESSMENT OF COMPLIANCE

See assessment of compliance for Indicator 3.3.1 where we established the risk for conversion of natural forests to intensively managed "wood plantations" on Category 2 lands after 1997 is low. In the rare event that "wood plantations" are established on Category 2 lands after 1997, because land tenure on family forest lands is typically on the 'short end' of typical plantation rotation ages for planted pine, most current landowners would not have been responsible for the conversion. Typical rotation ages for loblolly pine in the southeast US range from 25 to 50 years (Cunningham et al). The NWOS notes that 55% of current family landowners have owned their land less than 25 years (Butler, et al. 2020, Southeast, Table 8), which roughly corresponds to the reference year of 1997. In the event of conversion to plantation, which, based on our analyses, seems unlikely, fewer than half of the current landowner population could bear direct responsibility and that number would diminish over time as the trend is that plantations are decreasing since 2005 - 2010.

Furthermore, based on recent trends, the FSC National Risk Assessment (NRA) concluded, like similar analyses (Forest2Market, 2017, pp6), that conversion of natural and semi-natural forests has historically been driven by agricultural expansion, and more recently, by urban development associated with population growth. While the NRA did note that tree plantations are expected to continue to increase in extent in the US, this will most likely occur through afforestation (of non-productive agricultural lands or degraded forest lands), not conversion of existing forests (FSC, 2019, pp170). Through time, the planting on these non-productive and degraded lands reflects implementation of US federal policies, particularly the Soil Bank Program (now retired) and Conservation Reserve Program (CRP), which provide supplemental funding to landowners for planting trees for soil conservation and to improve environmental health and quality (Helms, 1985; Chen et al; USDA 2020).

Given the information outlined above, our conclusion is that the risk of non-conformance to Indicator 3.3.2 is low because:
1. On the rare occasion that an intensively managed wood planation has been converted from natural forests after 1997, given the majority of family forest owners have held their lands for less than 25 years, current owners are increasingly unlikely to be responsible for the conversion; and,
2. More recently, and into the future, planted stands established on Category 2 lands are expected to result primarily from afforestation (e.g., non-productive agricultural lands or degraded forest lands), and be associated with government incentive programs intended to promote environmental health.

DISCLAIMERS AND CONSIDERATIONS:
- In the quantitative analyses of FIA data, we selected 1995 and 2015 as reference years as they represent the closest available summaries of the FIA census relative to our reference date of 31 December 1997 and the present.
- We did not apply a family forest land ratio to the FIA data or results for planted area within the RBA from 1995 through 2015 because qualitative analysis indicates plantations are more likely to occur on other ownerships (Zhang, et al, 2012).

PRINCIPLE 4: THE USE OF BIOMASS DOES NOT RESULT IN LONG-TERM CARBON DEBT

CRITERION 4.1 The forest management unit where the wood is sourced is managed with the aim of retaining or increasing carbon stocks in the medium or long term.

INDICATOR 4.1.1 The economic operator shall provide clear and sufficient evidence that the harvesting rates and methods ensure that carbon stocks, in terms of tree stands or other carbon proxies, are maintained or increased in the medium or long term.

INDICATOR 4.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

Because Criterion 4.1 as written applies specifically to the FMU level, this Criterion cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because above ground wood volume on forested lands is tracked regularly by the USDA Forest Service Forest Inventory Analysis (FIA) on roughly a five-year interval throughout the entire US, these data show that changes in stocking levels can be identified and documented for Category 2 lands in aggregate for the RBA region, including at the state and county level.

Carbon is continuously cycled in ecosystems and is comprised of biomass above ground, below ground, dead wood, litter, and soil, as well as forest products harvested. Above ground biomass includes the tree's stem, branches, stump bark, seeds, and foliage. As trees photosynthesize and grow, carbon is removed from the atmosphere and stored in living tree biomass. (Domke, 2020) Because this criterion is focused on carbon stocks related to harvesting, our analyses generally used above ground tree volume as a proxy for carbon. We also focused, where possible, our other considerations around "forests remaining forests" because this land category best represents the impacts of management regimes on carbon stocking and flux.

To understand current harvesting rates in the geography of interest and impacts on carbon stocking, we conducted change detection analysis of standing above ground tree volume on classified timberlands, using aggregated FIA plot data. This dataset is drawn from the most recent plot measurements and immediate past plot remeasurement, with an intervening time span of approximately 5-7 years, for the counties in the geographic scope. This included net growth and harvest removals for each forest type group and county combination. Data were compiled, by Chris Oswalt, USDA Forest Service, FIA Unit, Southern Research Station, using EVALIDator, which allows users to produce a large variety of population estimates and their sampling errors based on the current FIA database.

All forest type groups were included except non-stocked, tropical hardwoods, exotic hardwoods, based on analyses for 3.3 and 7.3, as well as consultation with experts. Initial analyses also removed all species not recorded in the sample area. Harvest and growth rates were compared using current volumes to yield percent of total change over time at the county level.

We also engaged stakeholders, conducted expert interviews, and reviewed relevant literature.

ASSESSMENT OF COMPLIANCE

Nationally, forest management practices, the regeneration of forest areas cleared more than 20 years ago, and timber harvesting have resulted in net uptake (i.e., net sequestration or accumulation) of carbon each year from 1990 through 2017 (EPA, 2019,996-25). Studies of carbon flux indicate that above ground carbon stocks in forests remaining forests have increased over the last 20 years, across each of the states (see Table 83, Florida; Table 94, Georgia; Table 398, South Carolina in Domke, 2020.) For private ownerships, growth to drain ratios have been stable across the South, with growth consistently exceeding removals (Forest2Market, 2017, pp65-66).

Our quantitative analyses concur with these broader trends and found increasing volumes of carbon, based on net volume change. Across the geographic scope of the RBA, there was an average annual net increase of 1.8% standing volume. Of the 242 counties in the RBA region, 29 counties reported a net loss. Of these, 14 had net loss of more than 1% and just one was greater than 5% (but under 10%) over the 5 to 7-year inventory cycle. In our analyses, the remaining 202 counties reported average annual net increases. Considering sample sizes and errors at the finer scale (county) and the increasing reliability of both FIA data and results at increasing scale, as well as the relatively marginal reported net changes, especially the losses, the general deduction of this analysis is that volumes, and therefore carbon stocks, are holding steady or slightly increasing.

Our analysis could not isolate volumes associated with family forest lands specifically at the county level due to data availability and the inability to apply a family forest ratio to volumes and appropriately account for intensity of management. However, research and stakeholder engagement suggest that, by their nature, family-owned forests in this region tend not to be intensively managed (see introductory section on Category 2 lands) and per acre stocking analyses suggest REIT/TIMO ownerships are more intensively managed (Zhang, et al. 2012 pp359). As such, the marginal net losses of volume, as a proxy for carbon, are more likely to be attributed to other ownership classes, not family woodlands.

More broadly, there appears to be consensus that, if current harvesting practices and regeneration activities on forested lands are maintained, carbon stocks in the forest land remaining forests are likely to continue to increase in the near term, though possibly at a lower rate. (EPA, 2019,996-25). Our own quantitative analyses suggest that, at the landscape scale, current management regimes are, generally, sufficient for maintaining carbon stocks.

Review of NWOS results suggest that climate change is of moderate to great concern for 60% of family landowners. This suggests openness and or interest by the demographic to management for carbon in support of climate goals. However, only 14% of family landowners in the region have a written management plan, which would more specifically support management for carbon stocking over the medium- to long-term.

In summary, our conclusion is that that there is clear and sufficient evidence that the harvesting rates and methods ensure that carbon stocks are maintained or increasing overtime. Therefore, we conclude a low risk of non-compliance for Indicator 4.1.1.

DISCLAIMERS AND CONSIDERATIONS
- AFF's analysis and results are calculated in volume which do not translate to total acreage - for this reason Family Forest Ownership and Forested Area ratios have not been applied to the final results.
- We cannot conclusively link trends observed to family woodlands specifically.

CRITERION 4.2 Biomass shall not be sourced from stumps unless these stumps had to be removed from the site for other reasons than wood or biomass production.

INDICATOR 4.2.1 The biomass producer shall demonstrate that the risk of accepting or accidentally accepting unregistered wood or biomass from trunks received from its suppliers can be considered low.

INDICATOR 4.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Records/receipts from mills (e.g., SBP requires the keeping of feedstock input records too, see below). Individual Delivered Fiber Agreements - may not say anything specific regarding stumps, but will show what is accepted, which isn't stumps. Supply Base report for SBP (For example GA Biomass here. Copies of mill manuals/documents for scalers or wood suppliers outlining requirements for accepted biomass at the gate (if they state anything about stumps).
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Reviewing BMP standards, mill supply agreements, and consultations with experts and pellet producers revealed a common practice in the south to not harvest stumps for biomass. Georgia, Florida, and South Carolina BMP manuals did not specifically address removing stumps, but all require minimizing soil disturbance.

ASSESSMENT OF COMPLIANCE

Common practice among biomass producers in the south would rarely involve sourcing of biomass from stumps, especially on smaller, family-owned properties. Consultations with experts and pellet producers indicate that it would be highly unusual for stump material to be accepted at a biomass mill. The pellet producers interviewed indicated that their mill would not accept stumps and were generally consistent that this was not a common practice in the industry. (Note: the term "trunk" in the indicator language is interpreted to mean "stump" for the scope of this analysis as trunk otherwise refers to the bole or main stem of the tree.)

Some direct quotes from pellet producers interviewed are provided below (see above for interview information):
- Barry Parrish: "This just doesn't happen, I don't know of anyone who harvests stumps for biomass or paper, even."
- Elizabeth van Tilborg: "No one sources biomass from stumps."
- Stephen Logan of F&W Forestry Services also confirmed this common knowledge and practice. He sees limited stump removals only for the local rosin production industry, but not biomass.

The reasons for this are multifold, according to the responses of the professionals consulted. First, most landowners do not usually want stumps removed, as it leaves a large hole and area of disturbance in the ground that would need further remediation to improve aesthetics and safety. Furthermore, most biomass mills will only accept roundwood and chips with limited components of residual dirt, and the rocks and dirt/soil that are usually clumped on the root mass would create a challenge for removal and problems during processing. Stumps are typically expensive to extract and challenging to transport, and this practice is usually cost prohibitive. The USFS Southern Research Station (SRS) has examined stump harvesting potential in the United States and has

also determined that this is not a common practice in the U.S. (Mitchell, 2009). The USFS SRS review supports the findings gathered during our consultations, in that stump and root mass harvesting "may seem like a very strange and costly way to obtain biomass" and that it is typically only associated with land clearing, such as for construction sites (Mitchell, 2009). Transportation costs would be high because the odd-shaped pieces, with main root masses attached, would not compact well or bunk (stack) securely in normal log trucks. Some type of comminution in the woods would be needed to reduce the size of the pieces for transport. Splitting and other pre-processing steps may be required to utilize traditional grinders and chippers, further increasing costs to biomass suppliers down the line (Mitchell, 2009). In most cases, harvesting stumps for biomass is simply not economically viable.

Finally, harvesting stumps creates challenges for implementing best management practices at harvesting sites, due to the soil disturbance caused and erosion mitigation that would be needed. Loggers and wood suppliers in our geographic scope are well trained in the use of Best Management Practices (BMPs) and consider them a mandatory part of operations. BMPs aim to control and minimize damaging effects to soil stability, and so loggers will avoid removing stumps as much as possible.

DISCLAIMERS AND CONSIDERATIONS:
- If there are weaknesses inherent in "common practice" arguments, this could be offset by requesting mill records or any other official mill documentation, if needed, to verify or prove (see below) the assertions made in consultations. Literature on stump harvesting in the southern US is limited.

INDICATOR 4.2.2 The biomass producer shall register all wood or biomass received from stumps. See above "alternative means of verification"

ASSESSMENT OF COMPLIANCE: SEE 4.2.1 DATA AND ANALYSIS
Given that it is very unlikely that biomass will be sourced from stumps, or that mills will accept stump material even if it were removed for reasons other than biomass production (see above assessment), it follows that the risk for 4.2.2 and 4.2.3 is accordingly low.

INDICATOR 4.2.3 In the event stumps are removed and used for biomass, the biomass producer shall demonstrate that these stumps had to be removed from the site for other reasons than wood or biomass production (e.g., road construction).

ASSESSMENT OF COMPLIANCE: SEE 4.2.1 DATA AND ANALYSIS
Given that it is very unlikely that biomass will be sourced from stumps, or that mills will accept stump material even if it were removed for reasons other than biomass production (see above assessment), it follows that the risk for 4.2.2 and 4.2.3 is accordingly low.

CRITERION 4.3 On average, less than half the volume of the annual round wood harvest from forests is processed as biomass for energy generation. Round wood from thinnings or from production forests with a rotation period of 40 years or less is exempt from this requirement.

INDICATOR 4.3.1 The economic operator shall have relevant information available showing that less than 50% of annual harvested round wood (excluding thinning) in its sourcing region is used for production of biomass products for energy generation. Round wood from production forests with a rotation period of less than 40 years is exempt from this criterion. Relevant information in this regard is any government report, NGO report, local economy statistics or similar information reflecting the allocation for biomass originating from the region.

INDICATOR 4.3.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

Using qualitative methods to assess compliance with this criterion, we interviewed pellet producer representatives and other experts and professionals and reviewed relevant literature.

EVALUATION OF COMPLIANCE:

The verification protocol states that "Round wood from production forests with a rotation period of less than 40 years is exempt from this criterion." The majority of roundwood utilized for biomass fuel in the Southeast U.S. is sourced from stands of a rotation of less than 40 years. This is largely due to the common silvicultural practices in the southeast United States. Average rotation ages have decreased overtime across the south as silvicultural regimes have evolved (Fox et.al. pp64). Additionally, most biomass is not typically sourced from sawtimber, as it is too costly, but rather, from residuals and intermediate thinning, which occurs at 15-20 years of age for most rotations in the south (Oswalt 2019). Top and bottom diameter limitations, which tend to be similar across mills due to the shared processes and similar equipment used, also direct sourcing toward shorter rotations. Therefore, wood from Category 2 land can be categorically excluded on the basis that typical rotation lengths are shorter than 40 years in this geography and that this is especially true for wood utilized by pellet producers. Consultations with pellet producers, foresters and other experts and stakeholders in our geographic scope supported these conclusions.

The risk that roundwood makes up greater than 50% of annual supply is also low. Research examining wood pellet mills feedstock in the south found that pellet mill feedstock represented less than 2 percent of the region's total roundwood output in 2015, and that the large majority of pellet feedstock was derived from residuals from 2015-2017 (Brandeis, 2019). Similar trends are observed to the present day. The US Forest Service's Timber Production Output (TPO) reports produced for each state indicate roundwood production by the fuelwood/ bioenergy category is less than 15% over the past several years for each of the states within this geographic scope. For example, in 2017, 7.6%, 11.3%, 7.7% of total statewide roundwood production was categorized as fuel/ bioenergy for Georgia, Florida and South Carolina, respectively (USDA, 2017). Similarly, Forest2Market reports that while pellet production has increased dramatically in the South in recent years, the sector remains dwarfed by traditional pulp and paper. (Forest2Market, 2017, pp19)

As previously mentioned, sourcing biomass from sawtimber and higher value roundwood generally is not economically viable or practical in the southeast. Moreover, expert consultation has confirmed these findings as common among the sourcing practices of pellet producers in our geographic scope. For example, 44% of feedstock going to Georgia Biomass in 2019 was roundwood, and none of this came from rotations greater than 40 years. In fact, average rotations tend to fall under 25 years within the sourcing area of Georgia Biomass. Roundwood at Fram Fuels comprises only 26% of feedstock and is unlikely to come from a stand older than 40 years. Individual mill records are available to document that less than 50% of feedstock from family-owned forest comes from roundwood, and moreover, the majority of feedstock comes from rotations less than 40 years. In summary, our conclusion is that that there is sufficient evidence that rotation ages are less than 40 years in this geographic scope. Moreover, secondary assessment of roundwood harvest that is used for biomass provides further evidence that this criterion 4.3 and its indicators 4.3.1 and 4.3.2 have negligible risk.

DISCLAIMERS AND CONSIDERATIONS:

Published literature is surprisingly limited in explicit documentation of rotation ages for key species. There were many studies comparing the impact of different rotation lengths and management activities, some papers that analyzed rotation lengths for a specific product (e.g., pine pulpwood, but not biomass) or for large scale plantations. There was also data from FIA/SRS showing the age distributions of stands across the US, suggesting rotations under 40 years to sustain the age class distribution. As a result, our evidence tended to focus on our knowledge of silviculture in the region and feedback from key, knowledgeable stakeholders/professionals.

INDICATOR 4.3.2 In the absence of regional biomass allocation information (as indicated in 4.1.1), the economic operator shall provide clear and sufficient evidence (e.g., total harvested and supplied wood and volumes supplied to pellet mills) that less than 50% of annual harvested round wood (except thinning wood) is sold to pellet mills. Roundwood from production forests with a rotation period of less than 40 years is exempt from this criterion.

ASSESSMENT METHODOLOGY

See 4.3.1 assessment. There is low risk that roundwood would come from forests of more than 30 years, we determine this indicator can be categorically excluded.

PRINCIPLE 6: RELEVANT INTERNATIONAL, NATIONAL, REGIONAL AND LOCAL LAWS AND REGULATIONS ARE COMPLIED WITH

CRITERION 6.1 The forest manager holds the legal right to use the forest.

EXPLANATORY NOTES:

Legal rights comprise at a minimum:

- land tenure and management rights;
- concession licenses;
- harvesting permits;
- legally required licenses for the exploitation, payment and claims related to ecosystem services.

INDICATOR 6.1.1 Documentation demonstrating legal rights to manage the land as forests and manage and utilize its forest resources (e.g., registrations in the land register, licenses, permits), including associated maps (where applicable), shall be provided.

INDICATOR 6.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY

Qualitative analyses and literature review, as well as stakeholder engagement.

EVALUATION OF COMPLIANCE:

The FSC US Controlled Wood National Risk Assessment (FSC CW NRA), published in April 2019, is the result of a comprehensive, multi-stakeholder process to identify risks of sourcing from five categories of unacceptable wood throughout the conterminous United States, including the three states (Florida, Georgia, South Carolina) covered by this RBA. Several dozen experts were consulted in the development of the FSC CW NRA representing industry, academia, social and environmental interests. The FSC CW NRA evaluated risk of sourcing illegally harvested wood by evaluating 21 discrete Indicators including: Land Tenure & Management Rights, Concession Licenses; Harvesting Permits; Payment of Royalties, Harvesting Fees; and Payment of Taxes among many other issues relating to legality. The result of the FSC's assessment is a determination of low risk throughout the conterminous US.

Based on FSC's analysis, for private landowners, recording of rights and interests to land is required by and enforced by state, resulting in low risk.

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank. This conclusion further corroborates that systems are in place in the US, in which the geographic scope of the RBA sits, and they are largely ensured through rule of law.

Based on the analysis of these sources, we determine the risk for this criterion to be Low within the RBA geography.

DISCLAIMERS AND CONSIDERATIONS:
NA

CRITERION 6.2 The forest manager complies with all obligations to pay taxes and royalties.

EXPLANATORY NOTES:
This includes all legally required taxes/royalties, such as (but not limited to):
- Forest harvesting fees such as royalties, stumpage fees and other volume-based fees, including payments based on correct
- classification of quantities, qualities, and species;
- Sales taxes which apply to wood being sold, including sale of wood as growing forest (standing stock sale)
- Taxes on income and profit related to profits derived from the sale of forest products and harvesting activities.

INDICATOR 6.2.1 Clear and sufficient evidence (statement from tax authorities, auditor's statement, payment receipts) that all taxes and royalties related to forest management are paid correctly (timely and in full) shall be provided.

INDICATOR 6.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY
Qualitative analyses and literature review, as well as stakeholder engagement.

ASSESSMENT OF COMPLIANCE:
The FSC US Controlled Wood National Risk Assessment (FSC CW NRA), published in April 2019, is the result of a comprehensive, multi-stakeholder process to identify risks of sourcing from five categories of unacceptable wood throughout the conterminous United States, including the three states (Florida, Georgia, South Carolina) covered by this RBA. Several dozen experts were consulted in the development of the FSC CW NRA representing industry, academia, social and environmental interests. The FSC CW NRA evaluated risk of sourcing illegally harvested wood by evaluating 21 discrete Indicators including: Land Tenure & Management Rights, Concession Licenses; Harvesting Permits; Payment of Royalties, Harvesting Fees; and Payment of Taxes among many other issues relating to legality. The result of the FSC's assessment is a determination of low risk throughout the conterminous US.

Based on FSC's analysis, for private landowners, risk of nonpayment or fraud of taxes and royalties related to forest management is low.

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular

the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank. This conclusion further corroborates that systems are in place in the US, in which the geographic scope of the RBA sits, and they are largely ensured through rule of law.

Based on the analysis of these sources, we determine the risk for this criterion to be low within the RBA geography.

DISCLAIMERS AND CONSIDERATIONS:
NA

CRITERION 6.3 **All applicable anti-corruption legislation is observed. If no anti-corruption legislation exists, the forest manager must take alternative anti-corruption measures proportionate to the scale and intensity of the management activities and the risk of corruption.**

INDICATOR 6.3.1 The economic operator is aware of any applicable anti-corruption laws and regulations and has a system in place to monitor its performance against these.

INDICATOR 6.3.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY
Qualitative analyses and literature review, as well as stakeholder engagement.

ASSESSMENT OF COMPLIANCE:
The FSC CW NRA evaluates corruption relating to FSC Controlled Wood Category 1 (Illegally Harvested Wood) and Controlled Wood Category 2 (Wood harvested in violation of traditional and human rights). For both categories, the FSC CW NRA concluded a Low-Risk rating throughout the conterminous USA.

The United States has a hierarchy of federal, state, and local laws and regulations concerning real and personal property, contracts, payment of feeds and taxes and protection of natural resources. These laws and regulations are implemented within biomass supply chains through training of loggers and foresters, contracts, and monitoring by the economic operators. Active enforcement of these laws exists within all levels of government.

Transparency International's Corruption Perception Index for the USA (69) as further evidence of a functioning rule of law in support of a risk designation for corruption.

Our analysis of these factors leads to a determination of Low Risk for the RBA geography.

DISCLAIMERS AND CONSIDERATIONS:
NA

INDICATOR 6.3.2 In countries with a Corruption Perception Index (CPI) lower than 50 and where anti-corruption laws and regulations do not exist or are ineffective, the economic operator ensures that staff whose roles carry a higher level of risk in the area of ethical business practice (e.g., sales, harvesting, logistics, dealing with local officials) are trained on what action to take in the event of an issue arising in their area.

INDICATOR 6.3.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY

We consulted Transparency Internationals Corruption Percentage Index for the United States.

https://www.transparency.org/cpi2019

ASSESSMENT OF COMPLIANCE:

Transparency International's Corruption Perception Index for the USA is 69/100 ranking it 23/180 countries evaluated. Consequently, Indicator 6.3.2 is not appliable to Category 2 lands in the US rendering a low-risk rating.

DISCLAIMERS AND CONSIDERATIONS:

NA

INDICATOR 6.3.3 In countries with a Corruption Perception Index (CPI) lower than 50 and where anti-corruption laws and regulations do not exist or are ineffective, the economic operator has a transparent and effective system in place for confidentially reporting and dealing with unethical business practices without fear of reprisals towards the reporter.

INDICATOR 6.3.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION	N/A

ASSESSMENT METHODOLOGY

Consultation of Transparency Internationals Corruption Percentage Index for the United States.

https://www.transparency.org/cpi2019

ASSESSMENT OF COMPLIANCE:

Transparency International's Corruption Perception Index for the USA is 69/100 ranking it 23/180 countries evaluated. Consequently, Indicator 6.3.2 is not appliable to Category 2 lands in the US rendering a low-risk rating.

DISCLAIMERS AND CONSIDERATIONS:

NA

PRINCIPLE 7: BIODIVERSITY IS MAINTAINED AND WHERE POSSIBLE ENHANCED

CRITERION 7.1 Sites with a high conservation value and representative areas of the forest types that are found in the forest management unit have been identified and are protected and where possible enhanced. The sites may contain one or more of the following values: diversity of species, ecosystems and habitats, ecosystem services, ecosystems at landscape level and cultural values.

INDICATOR 7.1.1 Documentation has shown that a process has been followed for the Forest Management Unit regarding the identification, protection and monitoring of sites with a high conservation value. This process shall contain at least the following elements:

- identification of sites with a high conservation value: locations of sites with a high conservation value shall be established. This is done using relevant regional scientific information, internationally and/or internationally recognised databases, environmental impact reports and information submitted by interested and affected stakeholders. Involvement of the local inhabitants or indigenous people is a condition for establishing cultural values;

- development and implementation of measures to protect sites with a high conservation value: potential threats regarding the identified sites with a high conservation value shall be established. Effective measures shall be developed and implemented to protect and/or reinforce the sites with a high conservation value. In the development of the measures, the stakeholders affected shall be proactively involved, with interested stakeholders involved on request;

- monitoring and feedback: within the framework of the forest management plan, there shall be an effective programme aimed at monitoring the status of the sites with a high conservation value and the effectiveness of the measures that have been taken. If necessary, the conservation measures shall be modified. A key part of the monitoring process is the proactive involvement of affected stakeholders and the involvement of interested stakeholders at their request.

INDICATOR 7.1.1 RISK RATING	Specified risk for 155 counties that overlap with Critical Biodiversity Areas and Primary Forest Types designated in the FSC CW NRA. Low risk for the remaining 87 counties.
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to Assessment Methodology section below.
MITIGATION (IF NEEDED)	Mitigation is required for pellet producers where areas of specified risk for Critical Biodiversity Areas and Primary Forest Types, as identified by the FSC National Risk Assessment (NRA) fall within their primary roundwood sourcing basin. Specific mitigation requirements for this indicator are outlined below and, more broadly, in the RBA's mitigation section

MITIGATION REQUIREMENTS: At the mill level, pellet producers must demonstrate that an appropriate area of Category 2 land area is being silviculturally treated specifically for the noted high conservation values (HCV) associated with the specified risks identified in the FSC National Risk Assessment (NRA) within their region of roundwood sourcing. The extent of land area treated for mitigation must be commensurate with the production of the specified volume of pellets, an assumed even distribution of harvesting activities across the supply basin and analysis of the area of Category 2 lands within the area of specified risk (see Calibrating Thresholds for Mitigation).

The specific activities implemented by Category 2 family landowners to protect, restore or enhance the noted HVC, their names (anonymized, where necessary to protect privacy), and the spatial location (anonymized, where necessary to protect privacy), including county, must be documented and reported to CABs performing verifications and to AFF to support overall RBA impact and effectiveness monitoring. Pellet producers may work with landowners directly to implement these measures or contract with third parties to support coordination of the implementation.

Unit of mitigation: Additional acres protected, restored, conserved, or treated by family landowners within the supply basin.

Evidence provided by pellet producer:
- Documentation (using standardized format and platform) of specific activities implemented by individual family landowners on Category 2 acres based on calibration of required land area to produce claimed SDE+ volume per year, per Calibrating Thresholds for Mitigation section. Documentation includes landowner name and location of property (anonymized, where necessary to protect privacy), number of acres treated and specific treatment activities.
- Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating the effectiveness of this mitigation measure. As such, RBA users must provide AFF with standardized documentation of mitigation activities within their roundwood sourcing regions and secure egress to implementing Category 2 landowners' properties for monitoring. RBA users must provide monetary support for this function and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

ASSESSMENT METHODOLOGY

Because Indicator 7.1.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the FSC National Risk Assessment has conducted a thorough analysis of threats to existing HCVs throughout the continental 48 states, including the entire RBA region, our methodology relies on the rigorous process associated with the FSC US CW NRA in combination with FIA data on county level presence of family forest lands. Consequently, our alternative means of verification considers HCVs at a regional scale, rather than at the FMU level.

A review of standards for common sustainability and biomass certification in the geographic scope, consultations with pellet producers on common practice and company sourcing requirements, and federal law protecting certain habitats. In addition, the NWOS was consulted to understand landowner behaviors and attitudes relative to nature protection. The status of species included in the NRA were also reviewed for consistency.

ASSESSMENT OF COMPLIANCE:

There are several strong, pre-existing mechanisms that serve to address compliance with this indicator including common practices by pellet producers; strong state and federal regulatory protections for species and habitats; and family landowner objectives for owning land. Likewise, stakeholder consultations largely support that management by family landowners support protection of HCVs. However, based on a precautionary principle, risk for this indicator is specified for specific geographies.

Most biomass producers in this region source wood from certified sources. Both SFI and FSC forest management standards have been approved by ADBE for meeting the requirements of Criterion 7.1. Unfortunately, neither of these certifications have been adopted at significant scale on family forests within the RBA region, and therefore, while potentially reducing risk marginally in some localities, the overall impact of these certifications is minimal for the purposes of the RBA and application to Category 2.

Consultations with pellet producers in this region described common practices including training of procurement staff in the identification of HCV areas and avoiding sourcing from HCV sites during procurement and harvest activities, when possible and, often, entirely. These practices are generally implemented in the context of a mill's certification for its sourcing practices, such as SFI Fiber Sourcing. However, because these schemes are not approved for SDE+, the application of these systems does not offer full demonstration of compliance.

The Forest Stewardship Council (FSC) National Risk Assessment (NRA) is a common reference used by biomass producers to identify HCV sites, especially for FSC Controlled Wood (CW) certificate holders and covers the entire geographic region of this RBA. Published on April 5, 2019, the FSC CW NRA is used by FSC CW certificate holders that aim to control uncertified forest materials in their supply chain. For controlled wood, FSC requires that non-certified materials are controlled to reduce the risk of sourcing that impacts high conservation values or contributes to the conversion of forests to non-forest uses. The NRA identifies 17 HCV risk areas across the United States, with several falling within the scope of this RBA (See APPENDIX IV FSC US NRA Specified Risk Area Maps). The FSC CW NRA incorporated expert consultations (including representatives of indigenous groups) and stakeholder comments from public consultations during its development. Under FSC CW standards, section 4.11, HCV 3 states that "Material shall not originate from areas where HCVs are present, unless specific measures that are designed to protect the HCV inherent in the ecosystem (e.g. logging in areas of rare, threatened, or endangered ecosystems is designed to protect the extent and values of these ecosystems) are in place" and additionally, that "Material shall not originate from areas where HCVs are present, unless there is evidence that confirms that local communities and Indigenous Peoples are engaged, and their requirements are met." The NRA is supported by rigorous datasets and sources including:

- NatureServe (which includes local consultation in sourcing data)
- The USDA Forest Inventory and Analysis (FIA)
- National Land Cover Dataset (NLCD)
- World Wildlife Fund (WWF)
- Global Forest Watch
- National Council for Air & Stream Improvement (NCASI) analyses

As such, the NRA represents a critical identification and mapping of HCVs using definitions consistent with those identified by the VP, leveraging credible scientific data and expertise and undergoing transparent public consultation. The NRA is widely accepted and used by a large portion of companies sourcing wood and all of

the pellet producers consulted in the development of the RBA. To this end, AFF finds the NRA to be an essential preexisting resource.

Consultations with Stakeholders on Common Practices

Consultation with stakeholders and experts is a required and essential source of information for the development of the RBA's risk assessment. AFF conducted independent and extensive stakeholder consultation processes including any organizations and individuals that may have an interest in the decisions or activities undertaken in association with this RBA. (For a more detailed description of this process, see the Gathering Information Section.) A total of 89 stakeholders responding to a questionnaire distributed by AFF in May 2020 indicated an interest in one or more of the three states located within the RBA region (FL, GA, SC). Eighty-one percent of those respondents indicated that the overall effectiveness of management practices undertaken by family forest landowners to conserve endangered plant and animal species and high conservation value areas are either somewhat or highly effective. Only 5% (n=4) of responses indicated conservation measures for biodiversity were not effective. All four respondents identifying themselves as being affiliated with an environmental organization indicated conservation measures for biodiversity are either somewhat or highly effective. These results indicate a relatively high degree of confidence in the effectiveness of family forest owners in protecting biodiversity. Consultations with biomass producers in this geography indicated that it a requirement for procurement staff and other relevant employees to be trained to identify high conservation value areas and associated risks in sourcing areas. Additionally, it is standard practice for procurement staff to produce and distribute maps identifying HCV sites and to ensure that suppliers are aware of their location and risks. Most biomass producers hold certifications with one or more of the programs described above, and as a result must keep their staff trained and up to date in order to uphold those standards. Training programs to educate loggers, foresters, and others within the biomass supply chain are implemented to ensure high conservation value forests are identified and protected. Georgia's Master Timber Harvester Program, Florida's Master Logger Program, and South Carolina's Timber Operation Professional Program all provide a 2-day initial training that includes threatened and endangered species training. These trainings will continue after the initial year through continuing education requirements. Consultations revealed that it is a common for both procurement staff and loggers to be professionally certified in one of these training programs, and in many cases, this is a contractual requirement. Based on our stakeholder engagement, foresters working with biomass producers within the RBA area have at least a Bachelor of Science degree in Forestry from a Society of American Foresters (SAF) accredited college or university. Environmental regulations and protections, including emphasis on the Endangered Species Act (described in more detail in the next section), are standard in a forestry curriculum accredited by SAF. Most biomass producers employ at least one registered professional forester on their staff. Registered professional foresters must have knowledge of threatened and endangered species and their habitats and must stay current through continuing education requirements as well.

Federal and State Regulations

Forestry practices in the target geography are subject to federal regulations, which are also typically referenced in state BMP manuals. All forestry operations must comply with the Endangered Species Act (16 U.S.C. 1531 et seq), the primary federal law in the US that protects imperiled species. These species are identified in the Threatened and Endangered Species List maintained by the United States Fish & Wildlife Service (USFWS). The listing of species under ESA follows extensive, species-specific habitat range mapping and stakeholder consultations, requiring the involvement of local communities and Indigenous People. The states in this geography also developed state wildlife action plans, which are statewide strategies to conserve populations of native wildlife species and their habitats. These include state-wide species lists, which contain species and protections including

and often beyond those required for protection by the ESA. These statewide action plans are drafted through work by many partners and stakeholders and uses the best available data to provide a comprehensive, adaptable assessment of conservation needs and a plan to address them. Congress requires an approved state wildlife action plan for states to receive State Wildlife Grants, the main federal funding source for states to conserve imperiled species. Although state wildlife plans are not regulatory, they serve as a baseline resource that stakeholders across the state use for conservation, as a framework to coordinate local conservation efforts with region-wide initiatives, and as an overarching strategy that aligns the efforts of multiple state agencies. Statewide plans also contain comprehensive monitoring programs and state agencies, alongside the USFWS, conduct ongoing monitoring of species populations and habitat.

According to the NWOS, 88% of landowners in the region report that "nature protection" is a moderately important, important or very important reason for owning land. It would seem reasonable that protection of known HCVs is aligned with their management objectives and practices. However, engagement of family landowners by resource professionals remains low, with 20% of ownerships seeking advice. As such, engagement of family forest owners to manage for protection of HCVs is a critical step.

In summary, despite a high degree of confidence expressed through responses to AFF's stakeholder survey in family forest owners' effectiveness in conserving biodiversity, strong awareness and common practices among BP procurement staff and trained loggers, and a robust framework of conservation initiatives at local, state and federal levels, we have elected to take a precautionary approach in assessing risk of non-compliance to Indicator 7.3.1. In recognition of the comprehensive assessment completed by the FSC US CW NRA, we have adopted the NRA results for FSC Controlled Wood Category 3, HCV 1 and HCV 3 except for habitat for the patch-nosed salamander. After initially petitioning the US FWS to protect the patch-nosed salamander under the Endangered Species Act in 2010, the Center for Biological Diversity (CBD) subsequently withdrew their petition in 2018. Consequently, we are designating low risk for habitat of the patch-nosed salamander in the RBA. However, all counties within the RBA region that intersect with any of the critical biodiversity areas or priority forest types identified by the FSC CW NRA as having specified risk are similarly designated here. This designation for Criterion 7.1 aligns with the risk designation for Indicator 7.3.3. There are a total of 155 counties within the RBA region that contain one or more Critical Biodiversity Areas (CBA) and/or Primary Forest Types designated with specified risk by the FSC US CW NRA. In total, seven HCVs are identified: Central Appalachians CBA (GA); Central Florida CBA (FL); Florida Panhandle CBA (FL, GA); Southern Appalachians CBA (GA); Late Successional Bottomland Hardwoods Primary Forest Type (FL, GA, SC); Mesophytic Cove Sites Primary Forest Type (GA); and, Native Longleaf Pine Primary Forest Type (FL, GA, SC). Refer to Appendix IV for a complete list of counties and associated HCVs.

INDICATOR 7.1.2 Sites that, after the completion of the process, have been identified as sites with a high conservation value shall contain at least one of the following values:

- diversity of species: concentrations of biological diversity, including indigenous species and endangered species that are of importance on a global, regional or national level;
- ecosystems and habitats: rare or endangered ecosystems, habitats or refugia;
- ecosystem services: basic ecosystem services in critical situations, such as protection of important water sources and control of erosion of vulnerable soils and slopes;
- ecosystems on landscape level: whole forest landscapes or other big whole ecosystems, or mosaics of ecosystems, on landscape level that are of importance on a global, regional or national level because they contain viable populations of the majority of the natural species in natural patterns of spreading and numbers;
- cultural values: sites or means of living that are of global or national cultural, archaeological or historical importance and/or of fundamental importance to the traditional culture/beliefs of the local population or indigenous people.

INDICATOR 7.1.2 RISK RATING	Specified risk for 155 counties that overlap with Critical Biodiversity Areas and Primary Forest Types designated in the FSC CW NRA. Low risk for the remaining 87 counties.
ALTERNATIVE MEANS OF VERIFICATION	Yes, refer to the Assessment Methodology section for Indicator 7.1.1.
MITIGATION	Refer to mitigation for Indicator 7.1.1

ASSESSMENT METHODOLOGY

As with Indicator 7.1.1, we conducted a review of the standards for common sustainability and biomass certification in the geographic scope with particular emphasis on the FSC US CW NRA.

ASSESSMENT OF COMPLIANCE:

As discussed in 7.1.1, The FSC US Controlled Wood NRA completed a comprehensive assessment of the risk of sourcing from lands that support HCVs that could be threatened by management activities. The FSC has identified six categories of HCVs, each listed below.

- HCV1: Forest areas containing globally, nationally and regionally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)
- HCV2: Forest areas containing regionally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
- HCV3: Forest areas that are in or contain rare, threatened or endangered ecosystems
- HCV4: Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)
- HCV5: Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health)
- HCV6: Forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

The six HCV categories included the in FSC US CW NRA are consistent with the values listed in Indicator 7.1.2. We are therefore confident that the results of the NRA can be relied upon to designate an appropriate risk level, and to inform mitigation actions for reducing risk of non-compliance with Criterion 7.1.

INDICATOR 7.1.3 Local communities must be involved in the establishment and evaluation of strategies and actions to maintain and/or enhance the sites of high conservation value if they were consulted to help identify these sites.

INDICATOR 7.1.3 RISK RATING	Specified risk for 155 counties that overlap with late successional bottomland hardwoods and/or native longleaf pine ecosystems Critical Biodiversity Areas and Primary Forest Types designated in the FSC CW NRA. Low risk for the remaining 87 counties.
ALTERNATIVE MEANS OF VERIFICATION	Yes, refer to the Assessment Methodology section for Indicator 7.1.1.
MITIGATION	Refer to mitigation for Indicator 7.1.1

ASSESSMENT METHODOLOGY

As described with Indicator 7.1.1, we conducted a review and analysis of activities associated with the identification and protections of HCVs and biomass sourcing in the geographic scope with particular emphasis on the FSC US CW NRA.

ASSESSMENT OF COMPLIANCE:

As addressed in 7.1.1, local stakeholder consultation is an integral part of the FSC US CW NRA. The process of developing the FSC CW NRA took place over a period of six years involving several working groups, committees and advisory groups representing a broad spectrum of interests. The FSC conducted two distinct public consultation processes. Thirty-nine subject area experts were directly engaged in the development of the NRA, and over 200 stakeholders were consulted. Subsequent to the development of the NRA, FSC held regional meetings, webinars and discussion forums with interested stakeholder to further develop mitigation actions for reducing the risk to HCVs. Results of these meetings, including the development of mitigation options, are publicly available on the FSC US website. Furthermore, the FSC relied on NatureServe data for conducting the risk assessment of HCVs. Stakeholder consultation is integral in collecting source data for NatureServe.

The development of this RBA also involved significant stakeholder consultation. A questionnaire addressing a wide range of forest management issues was provided to over 23,000 individuals and organizations, with over 300 responses received. As noted in the assessment of conformance for Indicator 7.1.1, a total of 89 stakeholders responding to AFF's questionnaire indicated an interest in one or more of the three states located within the RBA region (FL, GA, SC). Approximately half of respondents identified themselves as landowners or landowner associations with the remainder distributed among a diverse range of backgrounds including environmental organizations, community members, consulting foresters and other resource professionals, forest industry, public agencies, trade/labor organizations and academia. Through these stakeholder groups, the vast majority of which represent locally embedded and grassroots institutions, and other targeted outreach, local communities were further engaged to inform HCV designations and actions, as they relate to family ownerships in the geographic scope of the RBA specifically. Please refer to Annex II, Stakeholder Consultation Results and Summary for details. Additionally, upon completion, the final draft of the RBA will be made publicly available.

The intent of this indicator is to ensure that the involvement of stakeholders from local communities does not stop at the identification of HCV sites, but rather continues as strategies are developed to maintain and/or enhance these sites. AFF will be responsible for monitoring the effectiveness of the RBA as a whole, as well as the effectiveness of mitigation actions taken to reduce risk to HCVs and other issues assigned specified risk in the RBA. Stakeholder consultation will be a fundamental component of those monitoring activities. Refer to Appendix IV for a complete list of counties and associated HCVs.

As with Indicator 7.1.1 and 7.1.2, we have adopted the risk designations for 155 counties that overlap with Critical Biodiversity Areas and Primary Forest Types designated in the FSC CW NRA. In total, seven HCVs are identified: Central Appalachians CBA (GA); Central Florida CBA (FL); Florida Panhandle CBA (FL, GA); Southern Appalachians CBA (GA); Late Successional Bottomland Hardwoods Primary Forest Type (FL, GA, SC); Mesophytic Cove Sites Primary Forest Type (GA); and, Native Longleaf Pine Primary Forest Type (FL, GA, SC).

CRITERION 7.2 **Measures have been taken to protect endangered plant and animal species and, if applicable, to increase the populations and enhance the habitats of these species.**

INDICATOR 7.2.1 Threatened and endangered species and their habitats (e.g., nesting and feeding areas) that are present or are likely to be present within the FMU are identified based on "best available information" known to and observed by the economic operator and based on what could be learnt from neighbours and other local stakeholders.

INDICATOR 7.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Because the conservation status of threatened and endangered species is typically designated at the federal or state level, imperiled species' presence or likely presence is assessed at the state level rather than the FMU level. Furthermore, IUCN rankings are not typically used by landowners and natural resource managers in the United States for determining the conservation status of imperiled species. Common practice involves referencing national rankings assigned by the US Fish and Wildlife Service under the authority of the Endangered Species Act. As the definitive legal authority and "best available information" for practitioners in the US, the ESA is the most appropriate reference in the US, rather than the IUCN Red List, for determining the conservation status of species occurring within the RBA region. A thorough comparison and analysis of IUCN and ESA listings was conducted to identify overlap as well as the potential impact of any gaps in species identification, and associated habitat needs would aid in fully determining the appropriate use of the various data sources in the identification of threatened and endangered species and their habitats within the FMUs. Studies that link logger training to performance, particularly relating to identification and protection of endangered species.
MITIGATION (IF NEEDED)	N/A
CAN THESE RESULTS BE APPLIED TO OTHER STATES?	Yes, with state-specific analysis replicated as needed.

ASSESSMENT METHODOLOGY

Because Indicator 7.2.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk-Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the conservation status of threatened and endangered species is typically designated at the federal or state level, imperiled species' presence or likely presence is assessed at the state level. Furthermore, IUCN rankings are not typically used by landowners and natural resource managers

in the United States for determining the conservation status of imperiled species. Common practice involves referencing national rankings assigned by the US Fish and Wildlife Service under the Endangered Species Act's authority. As the definitive legal authority and "best available information" for practitioners in the US, we propose the ESA is the most appropriate reference in the US, rather than the IUCN Red List, for determining the conservation status of species occurring within the RBA region.

Our assessment involved: Qualitative analysis using literature review, expert analysis, and stakeholder consultation. Quantitative analysis comparing the IUCN and ESA Species Lists as well as state species lists. We also consulted with stakeholders and experts.

EVALUATION OF COMPLIANCE:
The US Endangered Species Act

The most widely accepted and utilized list of these species in the RBA area, as well as the United States as a whole, is the Threatened and Endangered Species List maintained by the United States Fish & Wildlife Service (USFWS) under the jurisdiction granted to them by the United States federal law entitled The Endangered Species Act (ESA) of 1973, as amended (16 U.S.C.1531 et seq). The ESA operates with the full weight of federal law in the US, and enforcement actions can result in significant social and economic impacts. Listing species under the ESA is a more significant process as compared to lists that are not legally binding. The ESA listing process is based on a comprehensive analysis that involves collecting and analyzing the best available information to evaluate the species' current status and extinction risk. This status review is subject to scientific peer review and thorough public consultation, often involving multiple years. The decision of whether to list a species as threatened or endangered is based solely on the best available scientific and commercial information and does not consider economic impacts. Under the ESA, a species must be listed if it is threatened or endangered because of any of the following factors:

- imminent harm to its habitat
- over-harvesting
- disease or predation
- inadequacy of existing regulatory protections
- other factors threatening its existence

The ESA has improved the conservation status of most listed species over time and is estimated to have prevented 227 extinctions, making it possibly the world's most effective biodiversity protection law.

Comparing the ESA with the IUCN

While the ESA list is distinct from the IUCN list, which is specified in the Dutch legislation definition for endangered plant and animal species, it includes many species that are not identified by IUCN. We conducted a comparison of the IUCN and ESA threatened and endangered lists within the three states encompassing the RBA area (Table 1). The analysis relied on the NatureServe database and included the IUCN categories of Critically Endangered, Endangered, and Vulnerable, which were interpreted as corresponding with definitions that are applicable to the protocol.

Risk Assessment Table II: Species listed by IUCN and ESA in Florida, Georgia, and South Carolina

State	Species listed by IUCN	Species listed by ESA	Species listed by both
Florida*	73	71	26
Georgia**	96	66	33
South Carolina ***	46	33	12

As noted, many ESA listed species are not present in the IUCN list and vice versa. Our analysis showed 147 species within the RBA region listed by IUCN as Critically Endangered (CR), Endangered (E), or Vulnerable (VU). Alternatively, 121 species are listed by the ESA as Threatened (T) or Endangered (E). A total of 221 species within the RBA region are listed either by IUCN or ESA. We found that 100 species are listed by IUCN but are not listed by ESA. Alternatively, 74 species listed by ESA are not listed by IUCN. For the 100 species listed by IUCN but not by ESA, 12 are listed as CR, 38 as E, and 50 as VU.

While the credibility and effectiveness of the ESA as the definitive authority on determining the conservation status for species in the US is well established, we conducted further analysis to provide additional context for the 100 species listed by IUCN but not listed by ESA. A careful analysis identified 54 species that are not associated with upland or wetland forests. These species are instead associated with non-forest, wetlands, aquatic habitats, urban or agricultural landscapes. Included in these 54 species are 13 fish, ten freshwater mussels, nine crayfish, eight plants, two salamanders, two amphipods, two insects, six snails, one turtle, and one bird. Any of these species that occupy riparian or aquatic habitats intersecting forested environments are de facto protected by adherence to forestry best management practices (BMPs). As demonstrated under Criterion 8.2, BMP compliance rates for all three states within the RBA region are extremely high, and BMPs have been shown to be effective at protecting water quality and other forest attributes in multiple independent studies.

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*ESA list, Florida: https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?stateAbbrev=FL&stateName=Florida&statusCategory=Listed&status=listed

**ESA list, Georgia: https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?stateAbbrev=GA&stateName=Georgia&statusCategory=Listed&status=listed

***ESA list, South Carolina: https://ecos.fws.gov/ecp0/reports/species-listed-by-state-report?stateAbbrev=SC&stateName=South%20Carolina&statusCategory=Listed&status=listed

For the remaining 46 species listed by IUCN but not ESA, we found seven species that are either not endemic to the region or not currently determined to be at risk by established US authorities. We determined that 18 of these species are listed by one or more states and thus offered state-level protection; 8 whose habitat aligns with counties assigned with specified risk designations for High Conservation Values or conversion by the FSC US CW NRA (and adopted as such by this RBA); 3 species protected by adherence to BMPs; 2 that have habitats/ranges mostly already under protected status (easements and publicly managed lands, etc.); 2 under consideration and being reviewed for listing by the US FWS; and 1 (longleaf pine) whose conservation is the central mission of several well-funded and dedicated public and private initiatives in the RBA geography (and as a result is a major priority of most foresters in both outreach and management planning). This leaves only five species listed by IUCN that are present within the RBA region and are not directly assigned with formal protections. However, all of these species are either relatively abundant, not directly threatened by forest management activities, or afforded protections indirectly by other means. These five species are listed in Table III.

Risk Assessment Table III: IUCN listed species without ESA listing or other formal safeguards in place.

COMMON NAME	SCIENTIFIC NAME	IUCN RANKING	PRESENCE	OBSERVATIONS
Saluda Burrowing Crayfish	Distocambarus hunteri	VU	SC	Only known from two sites in a limited portion of the Saluda River drainage. No known species specific major threats currently occurring, however, there is intended urban and commercial construction in Saluda county.
Butternut	Juglans cinerea	EN	GA, SC	Occurs throughout the central and eastern United States and southeastern Canada. Primary threat is butternut canker, presently no known remedy.
Torreya Pygmy Grasshopper	Tettigidea empedonepia	CR	FL	Only one known occurrence in Florida from Long Branch Ravine in a slope forest habitat. Slope forests are located only along a 35 km stretch of the Apalachicola River in sheltered ravines on the eastern side of the river and are home to several protected species including the Florida torreya tree (state and federal listed as Endangered) and Florida yew (state listed as Endangered).
Little Brown Myotis	Myotis lucifugus	EN	GA, SC	The core of the range appears to be the northeastern United States and boreal Canada. Use a wide range of habitats and often use human-made structures for resting and maternity sites; they also use caves and hollow trees. Foraging habitat requirements are generalized, typically near water. The most serious threat is white-nose syndrome.
Tricolored Bat	Perimyotis subflavus	VU	FL, GA, SC	Large range in eastern and central North America; many roost sites and locations, expansive foraging habitat. Associated with forested landscapes, where they forage near trees and along waterways. The most serious threat is white-nose syndrome.

This additional analysis provides some context for the interconnected and overlapping public and private conservation initiatives at work in the US and within the RBA region, more specifically, beyond the formal designations and legal protections offered by the ESA.
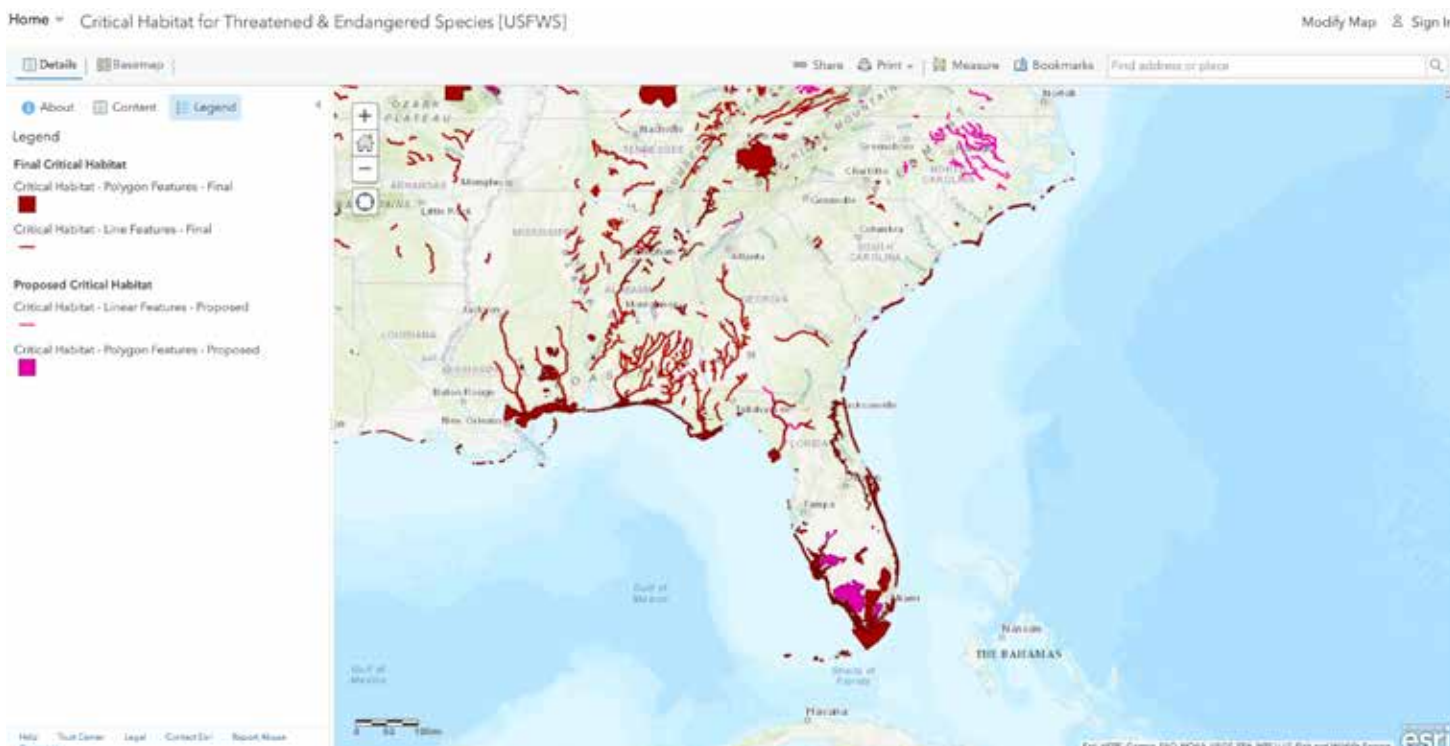
The review suggests that the two lists are generated by their organizations using different methodologies, scopes, and approaches to classification. The ESA list is generated through robust stakeholder engagement, an extensive and rigorous scientific process by a credible government agency. It is extensively utilized in the United States across all actors in the forest management space. In addition, the listing of species under ESA is accompanied by extensive species-specific habitat range mapping, accompanying recovery plans, and ongoing status monitoring, which constitutes the best available information to inform management actions.

Although the number of species on each list is different, it not immediately clear how these differences translate into differing habitat impacts or management needs. Also, the IUCN list includes a number of species that are identified as extinct, extinct in the wild, or data deficient, which expands the listing without aiding in management decision making. For example, a general search of the Red List for the RBA region of interest provides a total of 2,962 species. Narrowing the search to Critical Endangered (CR), Endangered (EN), or Vulnerable (VU), results in 147 species, as noted above. Alternatively, 121 species within the RBA region are listed as Threatened or Endangered by the ESA.

The US Fish & Wildlife Service Administration of the ESA

The USFWS has identified Critical Habitat for Threatened & Endangered Species. As shown in Figure 1, the identified habitats within South Carolina, Georgia, and northern Florida frequently correspond to river systems, riparian areas, and coastlines.

Risk Assessment Figure I: Critical Habitat for Threatened & Endangered Species

Source: https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77

The USFWS maintains the Environmental Conservation Online System (ECOS). ECOS allows landowners and forest managers, as well as economic operators, within the RBA area to determine to the county or sub-county level within each state if the best available data indicate which, if any, threatened or endangered species may be found near the FMU location. Within the ECOS platform, the Information for Planning and Consultation tool (IPaC) allows economic operators and foresters to delineate specific projects, such as FMU's, to generate a list of threatened and endangered species or their associated critical habitat that may be affected by the project. The report also gives possible remedies for addressing the potential impact on these species from the project. The availability of these resources is evidence that economic operators have ready access to information on listed species that may occur on their lands. Although no information is readily available to indicate the degree to which these tools are used by economic operators within the RBA, all are legally obligated to comply with the ESA.

One relevant example of the effectiveness of the ESA is the red-cockaded woodpecker (RCW), which is listed as Endangered on the ESA for all three states and closely associated with forest habitats. On the IUCN list, the species (also identified as Leuconotopicus Borealis) is listed as "near-threatened." The ESA listing of this species across the RBA area has resulted in the creation of Habitat Conservation Plans (HCPs) that guide forest management. For example, the HCP for RCW in Georgia describes the habitat as "… ranges from planted loblolly pine plantations to natural longleaf pine stands. It is expected that most of the potential HCP participants will be those landowners who grow commercial pine and have isolated red-cockaded woodpecker (RCW) groups." Georgia developed their HCP for RCW in 1999, and since then, nearly 160,000 acres of habitat, primarily on private lands, have been enrolled in protection and enhancement efforts. This illustrates how the use of the ESA listings results in forest managers in the region functionally protecting species at risk.

State and NGO Evaluations and Management

Under Chapter 6 of the ESA, the USFWS is authorized to cooperate with any state which establishes and maintains an adequate and active program for the conservation of endangered species and threatened species. Each state within the RBA geography has a companion law to the federal ESA and maintains a state list of threatened and endangered species. Each state in the RBA region has developed its own legal framework for protecting threatened and endangered species, with penalties stipulated for violating required protection measures. Many of the species on the state list may not yet warrant protections under the federal ESA but are species of concern within the state. These state lists are updated annually and are available to economic operators within the RBA area. The states in this geography also developed state wildlife action plans, which are state-wide strategies to conserve populations of native wildlife species and their habitats. These include state-wide species lists, which contain species and protections, including those required for protection by the ESA. These state-wide action plans are drafted through work by many partners and stakeholders and use the best available data to provide a comprehensive, adaptable assessment of conservation needs and a plan to address them. Congress requires an approved state wildlife action plan for states to receive State Wildlife Grants, the main federal funding source for states to conserve imperiled species. Although state wildlife plans are not regulatory, they serve as a baseline resource that stakeholders across the state use for conservation, as a framework to coordinate local conservation efforts with region-wide initiatives, and as an overarching strategy that aligns the efforts of multiple state agencies. State-wide plans also contain comprehensive monitoring programs, and state agencies, alongside the USFWS, conduct ongoing monitoring of species populations and habitat. In this way, states align with and enhance federal protections of at-risk species.

FSC US Controlled Wood National Risk Assessment

The FSC US Controlled Wood National Risk Assessment is the result of a comprehensive, multi-stakeholder process to identify risks and mitigation measures for sourcing of wood throughout the RBA and the conterminous US. Under the FSC CW standard (FSC STD 40 005), "material from unacceptable sources cannot be used in FSC Mix products." One of the five FSC controlled wood categories of unacceptable sources is "Category 3: Wood from forests in which high conservation values are threatened by management activities". There are six defined HCV categories, including HCV 1 Species Diversity, which includes "concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels." Similarly, Criterion 7.2 of the VP and its two associated indicators require that T/E species are identified where they are present or likely to be present, and appropriate measures are implemented to protect these species and their habitats.

When evaluating risk to endangered species and their habitats, the FSC relied on the NatureServe dataset, which is more comprehensive in terms of species identified than either the IUCN red list or the ESA. In consultation with stakeholders and experts, FSC considered several important factors, including level of impairment, rarity, vertebrate species, and forest habitat dependency. They looked closely at known threats to species. The result of the FSC US CW NRA analysis was a species risk designation for 19 species throughout the conterminous 48 states of the US. Only one of the species (patch-nosed salamander, Urspelerpes brucei) identified in the FSC CW NRA occurs within the RBA region. The FSC included the species due to its rarity and limited distribution; however, the species is not currently listed as threatened or endangered under the ESA and has been designated as a species of least concern on the IUCN red list. The US FWS was formally petitioned in 2010 by the Center for Biological Diversity (CBD) to list the species. However, in a letter to the US FWS dated 08 June 2018, "based on new scientific information, surveys, conservation actions, and the opinion of scientific experts," the CBD has subsequently withdrawn their petition regarding the patch-nosed salamander. Consequently, we have not adopted the HCV designation in the FSC US CW NRA for patch-nosed salamander for this criteria assessment. Even so, according to stakeholder input, because of its inclusion in the NRA, biomass producers in this geography train their staff to identify potential patch-nosed salamander habitat and the risks associated with each of them.

Training and Common Practice

Training programs exist within the RBA area to educate loggers, foresters, and others within the wood and biomass supply chain of the existence of the lists of threatened and endangered species and how information from the lists can be accessed and utilized to determine the possibility of the presence of species on FMU's. Georgia's Master Timber Harvester Program, Florida's Master Logger Program, and South Carolina's Timber Operation Professional Program all provide a 2-day initial training designed to improve safety, efficiency, and environmental protection, including threatened and endangered species training. The Georgia program requires 8 hours of continuing education training within a 2-year period and currently has just under 1,400 participants who are current in their training database. Florida's program requires 4 hours of continuing education annually and has over 400 participants who are current in their training database. South Carolina's program requires 2-3 hours annually and has over 1,100 participants who are current in their training database. Based on consultations with biomass producers, it appears to be common practice to require that any supplier/logger has completed a master timber harvester program (though this would need to be confirmed on a case by case basis) and that they maintain this certification through continuing education.

Based on our stakeholder engagement, foresters working with biomass producers within the RBA area have at least a Bachelor of Science degree in Forestry from a Society of American Foresters accredited college or university. Environmental regulations and protections, including an emphasis on ESA, are a standard part of any forestry curriculum. In addition, once hired, foresters undergo training outlined above, as well as additional company-specific training related to species protection. Economic operators in the geographic area of the RBA are trained and able to access lists as well as range data for threatened and endangered species present in their sourcing basins.

Stakeholder Perspectives

Consultation with stakeholders and experts is a required and essential source of information for the development of the RBA's risk assessment. AFF conducted independent and extensive stakeholder consultation processes, including any organizations and individuals that may have an interest in the decisions or activities undertaken in association with this RBA. For a more detailed description of this process, see the Gathering Information Section. A total of 89 stakeholders responding to a questionnaire distributed by AFF in May 2020 indicated an interest in one or more of the three states located within the RBA region (FL, GA, SC). Eighty-one percent of those respondents indicated that the overall effectiveness of management practices undertaken by family forest landowners to conserve endangered plant and animal species and high conservation value areas are either somewhat or highly effective. Only 5% (n=4) of responses indicated conservation measures for biodiversity were not effective. All four respondents identifying themselves as being affiliated with an environmental organization indicated conservation measures for biodiversity are either somewhat or highly effective. These results indicate a relatively high level of confidence in the effectiveness of family forest owners in identifying and protecting threatened and endangered species.

Based on information gathered from the 2018 iteration of the National Woodland Owner Survey, 90% of ownerships in this region identified wildlife habitat as a moderately to very important reason for owning their land, suggesting heightened awareness and interest in wildlife and their habitats. Similarly, 79% of the approximately 575,000 ownerships greater than 10 acres (4 HA), accounting for 84% of the acreage of 41,022,000 (16,601,014 HA) in the region, know their wooded land, suggesting that, in combination with their specific interest in wildlife habitat, family landowners would be aware or observing of wildlife and their habitats on their properties. Thus, the vast majority would be able to inform the economic operator of wildlife species and associated habitats they had observed on their land.

Conclusion

The Endangered Species Act, as well as state-level legislation, offer legally mandated protection of threatened and endangered species. The US FWS employs a comprehensive, rigorous, and credible scientific assessment process for determining the conservation status of species in the US. The ESA has a proven track record of success in protecting imperiled species. Our evaluation shows there are variances in species listed by IUCN and the ESA. However, from a practical perspective, taking account of utility for making management decisions for the protection of species at risk, the variance between the IUCN and ESA listings has been shown to have negligible effect. Based upon the assessment, it is clear that the best available information is widely accessible to allow for the identification of threatened and endangered species and their habitats within the FMUs of the RBA area of interest. Additionally, it is common practice for forestry professionals to consult data and conduct on the ground observations to determine the presence of T&E species. Furthermore, results from AFF's stakeholder

survey indicate a high degree of confidence in measures taken by family forest owners to conserve threatened and endangered species. Lastly, the FSC US CW NRA has employed a comprehensive, multi-stakeholder process in evaluating risks imposed on endangered species by forest management activities. The evidence provided is sufficient to demonstrate that robust and reliable information, tools, and training are widely available to landowners, land managers, loggers, and producers for the identification of threatened and endangered species. We have adopted the FSC US CW NRA results for endangered species, with the exception of the patch-nosed salamander, which was withdrawn from consideration for listing after the NRA process was complete. As a result of our analysis and the NRA conclusions, we have assigned a low-risk designation to Indicator 7.2.1.

DISCLAIMERS AND CONSIDERATIONS:

1. ESA data is the best available information in the US, but IUCN is recognized globally as an important source of information. NatureServe, which was the primary data source for the FSC CW NRA, is also a recognized, credible source of information on the conservation status of species.
2. This analysis assumes that listed species (regardless of listing organization) are not more or less likely to occur on family woodlands.
3. The 2018 National Woodland Owner Survey (NWOS) Results are the most recent available and are so recent they are currently in the final stages of review by US Forest Service officials. NWOS results reviewed include all size classes in the family/individual category. NWOS lead indicated results would likely be marginally differently if larger size classes but that larger land classes tend to be associated with greater levels of engagement and forest management activities.
4. There are other data sources that are good sources for data on species and habitat identification, such as NatureServe, that provided the framework for species identification in the FSC US NRA assessment.

INDICATOR 7.2.2 In the presence of threatened and endangered species within the FMU, appropriate forest management practices to protect or maintain the presence of threatened or endangered species and their habitats within the FMU have been defined and implemented. Appropriate forest management practices include, but are not limited to:

- conservation zones (or protected areas). The size and location of the conservation zones conform to national and local legislation and shall be sufficient to guarantee the continuing presence of the identified species. Conservation zones have been identified and marked on maps and, where necessary, on the ground, in a way that is visible when entering the zone;
- and reduced harvesting methods to protect nesting and breeding sites.

INDICATOR 7.2.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Refer to Indicator 7.2.1
MITIGATION	N/A
CAN THESE RESULTS BE APPLIED TO OTHER STATES?	Yes

ASSESSMENT METHODOLOGY

Refer to the Assessment Methodology section for Indicator 7.2.1 for alternative means of verification employed for demonstrating conformance.

Qualitative analysis using literature review, expert, and stakeholder consultation. Quantitative analysis utilizing protected areas within the RBA in tandem with land ownerships and acreage with the knowledge to determine the risk level.

EVALUATION OF COMPLIANCE:

As outlined under indicator 7.2.1, it is determined that threatened and endangered species are present and can be identified using ESA species listings within the area of the RBA. Landowners and forest managers are legally required to protect listed species and their habitat where ever they occur. HCP's are required under the ESA when listed species or their habitat may be threatened by management activities. HCP's provide for formal cooperation between the USFWS and private (or other non-Federal) managers to develop and implement protective measures to conserve listed species and their habitat. Additionally, Wildlife Action Plans have been developed for every state in the US and are updated every 10 years. These state-level plans are required to identify at-risk wildlife species, evaluate their conservation needs and describe actions necessary for their protection and recovery.

Legal protections are in place for these species and are enforced, including under the federal ESA containing civil penalties of up to $25,000 for each violation and criminal penalties of up to $50,000 and one-year imprisonment upon conviction of violations of the act. Each of the states represented in the geography of this RBA also has state laws protecting threatened and endangered species. Penalties for violations of these state laws include a misdemeanor in Georgia punishable by up to 12 months in jail and a maximum fine of $1,000; a misdemeanor in South Carolina with penalties of a $1,000 fine or one-year imprisonment, or both; and a third-degree felony in Florida punishable by up to five years in prison and a fine of up to $5,000. Because ESA prohibits "take" of these species, including the harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capture, or collection, or other such attempts, the ESA and its accompanying enforcement ensure the protection of listed species under federal law.

Each state's Best Management Practices (BMP) for forestry activities identify practices that can further protect and enhance wildlife habitat. From the Florida BMP manual, "These practices are designed as the minimum standards necessary for protecting and maintaining the state's water quality as well as certain wildlife habitat values, during forestry activities. As such, they represent a balance between overall natural resource protection and forest resource use." Georgia's BMP manual states, "Forest management practices such as timber harvesting, site preparation, tree regeneration, and within-stand treatments may be conducted in ways that enhance fish and wildlife habitat, aesthetics, and recreational opportunities, while accommodating sensitive sites and endangered species." The South Carolina BMP manual succinctly states, "All forestry practices must comply with the Endangered Species Act." BMP training is a part of each state's professional logger training program.

The Protected Area Database of the US (PAD-US) is published and maintained by the US Geological Survey Gap Analysis Program (GAP) and compiles public parks, designated areas, conservation easements, and Marine Protected Areas. It includes IUCN categories and is used to inform UN monitoring and reporting progress towards the Aichi Biodiversity Targets. Most of the designated lands in the database are written into federal law with applicable enforcements of protected status. In a recent study (2013), also cited in the FSC US NRA,

researchers Aycrigg et al. conclude that "The protected areas network within the continental US is often viewed as one of our best conservation tools for securing vegetation communities and the species they support into the future." According to their analysis, the current protected areas network in the continental US covers approximately 10% of the total area in which ecological systems occur. The paper also suggests that increased public-private partnerships may be important in the conservation of ecological systems in the Eastern US. The Protected Areas Database for the US shows that 14.5 million acres (5.9 million ha.) are permanently protected in the three-state area of the RBA region. Georgia has 2.5 million acres (1 million + ha.) or 6% of the total land base under permanent protection. In South Carolina, 1.6 million acres (648 thousand ha.) or 8% of the total land base are permanently protected, while Florida has 10.5 million acres (4.25 million ha.) or 25% of the total land base. These millions of acres (ha.) provide valuable protection for ESA listed species as well as other at-risk species within the RBA geography.

USFWS data reveals that the ESA has been successful in preventing the extinction of 98% of the species that have been listed since its enactment. Additional investigation shows that only two species are known to have become extinct in the southeast region since the passage of the ESA, and neither of those species (dusky seaside sparrow, green blossom pearly mussel) was forest-dependent and likely to have been impacted by forest management activities. With two-thirds of the ESA listed species depending exclusively or occurring on private lands, it is important to engage private landowners, especially family forest owners, in ongoing efforts to enhance species and their habitat. As described in 7.2.1, the use of Habitat Conservation Plans and Safe Harbor agreements have been effective in engaging private landowners in the protection of red-cockaded woodpeckers in the RBA area.

According to stakeholder input, biomass producers in this geography train their staff to identify ESA-listed species and their habitats within their sourcing areas and assess the risks associated with each of them.

NWOS results for the region suggest that 90% of ownerships in this region identified wildlife habitat as a moderately to very important reason for owning their land, suggesting heightened awareness and interest in wildlife and their habitats. However, only 20% have taken actions in the last five years to improve wildlife habitat. A 2017 report by the American Forest Foundation found that 87% of the family forest landowners in the 13-state southern region of the United States said that protecting and improving wildlife habitat is an important reason they own their forested land. 72% have implemented a wildlife habitat improvement activity, though many are not actively managing wildlife on an ongoing basis. 37% are unsure of the activities to best protect wildlife, while 34% indicated that the cost of the activities was too high. This suggests that additional support is needed for family landowners to enable management activities to enhance habitats of threatened and endangered species on Category 2 lands in the geographic scope. Furthermore, as reported under Indicator 7.2.1, results from AFF's stakeholder questionnaire indicate a high level of confidence (81%) in the effectiveness of family forest owners in identifying and protecting threatened and endangered species.

The FSC US Controlled Wood National Risk Assessment is the result of a comprehensive, multi-stakeholder process to identify risks and mitigation measures for sourcing of wood throughout the RBA and the conterminous US. When evaluating risk to endangered species and their habitats, the FSC relied on the NatureServe dataset, which is more comprehensive in terms of species identified than either the IUCN red list or the ESA. In consultation with stakeholders and experts, FSC considered several important factors, including level of impairment, rarity, vertebrate species, and forest habitat dependency. They looked closely at known threats

to species. The result of the FSC US CW NRA analysis was the identification of one species (patch-nosed salamander, Urspelerpes brucei) that occurs within the RBA region, and that species has since been withdrawn from consideration for listing under the ESA "based on new scientific information, surveys, conservation actions, and the opinion of scientific experts."

Our analysis shows that the ESA is a highly efficient system for the identification and protection of threatened and endangered species.   Based upon our analysis, the ESA, along with other conservation initiatives, likely provides protections for IUCN species associated with forest habitats that are most likely to be subject to active forest management in the region.   State regulations and law enforcement provide endangered species with further legal protections. BMPs, logger training, BP staff training and education, and the presence of permanently protected areas provide further enhancements to the security of imperiled species. The FSC US CW NRA completed a comprehensive, multi-stakeholder process to evaluate threats to endangered species from forest management activities. As with other Criteria in the VP, we have elected to adopt the NRA results for endangered species with the exception of the one species identified for the RBA region that has been formally dropped from consideration for ESA listing. Consequently, we conclude a low-risk designation is appropriate for Indicator 7.2.1.

DISCLAIMERS AND CONSIDERATIONS:

1. ESA data is the best available information in the US, but IUCN is recognized globally as an important source of information.
2. This analysis assumes that listed species (regardless of listing organization) are not more or less likely to occur on family woodlands.
3. The 2018 National Woodland Owner Survey (NWOS) Results are the most recent available and are so recent they are currently in the final stages of review by US Forest Service officials. NWOS results reviewed include all size classes in the family/individual category. NWOS lead indicated results would likely be marginally differently if larger size classes but that larger land classes tend to be associated with greater levels of engagement and forest management activities.
4. There are other data sources that are good sources for data on species and habitat identification, such as NatureServe, individual Natural Heritage Programs (1)(2)(3), and their state-based conservation lands data sources (FL) that provided the framework for species identification in the FSC US NRA assessment.

CRITERION 7.3 The conversion of forests within the forest management unit to other forms of land use, including wood plantations, is not permitted unless:

- the area concerned is small, no greater than 5% of the area of the Forest Management Unit on the benchmark date of 1 January 2008;
- it clearly leads to long-term advantages for nature conservation;
- and there is no damage or threat of damage to sites with a high conservation value.

EXPLANATORY NOTES

Clear long-term advantages for nature conservation means that the conversion fits in a long-term forest management plan and the related forest management measures. If, for example, the conversion is part of the construction of a road and this road is acceptable for nature conservation and the construction complies with all requirements than the conversion is compliant with C7.3. The requirements of C7.3 are referring to conversion within an FMU to other types of land use, including wood plantations. Beside this biomass from wood plantations that were created by conversion of natural or semi natural forests after 31 December 1997 is not accepted according to C3.3.

INDICATOR 7.3.1 Any parts of the FMU that are scheduled for conversion from natural or semi-natural forest to plantation or any other kind of non-forest land use have been clearly identified and documented.

INDICATOR 7.3.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes. See Assessment Methodology section below.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Indicator 7.3.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the forested area as well as the area in forest plantations is tracked regularly by the USDA Forest Service Forest Inventory Analysis (FIA) on roughly a five-year interval throughout the entire US, these data show that forest loss to other uses can be identified and documented for Category 2 lands in aggregate for the RBA region, including at the state and county level.

AFF conducted quantitative analysis of FIA data to evaluate trends in change to the total forest area within the RBA region going back to 2005. In this analysis we included changes to the area in plantations throughout the RBA region using the FIA data. We refined these results using qualitative analysis to estimate land use change on Category 2 FMUs using data from FIA and the NWOS. Additional qualitative analysis has been conducted using results from the NWOS to characterize landowner attitudes toward protection of their lands, interviews with experts to characterize Category 2 landowner attitudes on intensive forest management (relative to managing wood plantations). Lastly, we consulted the FSC US CW NRA regarding the risk of conversion in the lower 48 states, including the RBA region.

ASSESSMENT OF COMPLIANCE

In 1995 there was a combined total of 49,729,014 acres of forest in the three states that comprise the RBA (Florida, Georgia and South Carolina). Twenty years later in 2015, the total forest area was nearly unchanged at 49,811,072 acres, representing a net increase of 0.2%. During the intervening years, the FIA data indicates the total forest area fluctuated slightly, peaking in 2005 at 50,339,707 acres. Changes in total forest area within the RBA since 2005 are shown below in Risk Assessment Table IV. This data represents all ownership classes. The regular measurement of changes in forest area within the RBA region, and the easy access to this data through the FIA shows that at the scale of the RBA region, the area of forest converted to other uses is "identified and documented" as required by Indicator 7.1.1.

Risk Assessment Table IV: Total forest area and total planted area within the RBA, 2005 to 2015. All ownership classes.

State	2005		2010		2015	
	Forested Area - Ac.	Planted Area - Ac.	Forested Area - Ac.	Planted Area - Ac.	Forested Area - Ac.	Planted Area - Ac.
Florida	12,309,445	4,997,883	12,277,437	4,760,530	12,244,804	4,389,985
Georgia	25,021,825	7,681,657	24,785,324	7,751,661	24,634,881	7,697,021
South Carolina	13,008,437	3,503,418	13,112,703	3,402,932	12,931,387	3,270,697
TOTAL	50,339,707	16,182,958	50,175,464	15,915,124	49,811,072	15,357,703

FIA data shows that 45% of the forested area within the RBA region is classified as family forests (Florida 23.96%, Georgia 51.75%, South Carolina 52.48%) (Hewes et al, 2017). By applying these ratios to total forest areas, the forest area within the RBA represented by Category 2 lands can be calculated with reasonable accuracy. However, research indicates that plantations in the US South are disproportionately located on industry lands with 10% of forest ownership in REITs and TIMOs, yet 26% of plantations occurring on those same lands (Zhang, et al, 2012). As further evidence that intensively managed "wood plantations" are relatively uncommon on Category 2 lands, only 15% of all family ownerships report that production of timber products is "very important" as a reason for owning their land (Butler, et al. 2020, Southeast, Table 7). Hence, the area of plantations actually occurring on family forest lands is likely overstated by applying forest ownership ratios for all forested lands. Therefore, the numbers reported below in Risk Assessment Table V are most likely exaggerated for Category 2 lands within the RBA region.

Risk Assessment Table V: FFO ownership ratio, forest area and planted area within the RBA, 2005 to 2015.

State	FFO Forest Area - % RBA	2005		2010		2015	
		FFO Forest Area - Ac.	FFO Planted Area - Ac.	FFO Forest Area - Ac.	FFO Planted Area - Ac.	FFO Forest Area - Ac.	FFO Planted Area - Ac.
Florida	24%	2,949,672	1,197,626	2,942,002	1,140,750	2,934,182	1,051,958
Georgia	52%	12,947,906	3,974,985	12,825,525	4,011,210	12,747,677	3,982,935
South Carolina	52%	6,827,456	1,838,763	6,882,180	1,786,023	6,787,016	1,716,620
TOTAL	45%	22,725,035	7,011,374	22,649,708	6,937,983	22,468,875	6,751,513

FIA data, which is regularly updated roughly every five years, allows net changes in area of forest land to be accurately identified according to forest type and ownership class at the county and state level. Qualitative information available through the NWOS provides further refinement of trends on family forest lands regarding conversion to wood plantations. With ready access to these data sets, the risk of nonconformance is low.

DISCLAIMERS AND CONSIDERATIONS:

1. Indicator 7.3.1 requires that information on converted forest lands is "clearly identified and documented". We have demonstrated that data relating to changes in forest land area within the RBA region is readily available, and therefore we find the risk for Indicator 7.3.1 to be low. Indicators 7.3.1 and 7.3.2 address risks of conversion (as contrasted with risk related to identifying and documenting converted forest lands), and we have concluded specified risk for those two Indicators, and consequently for Criterion 7.3.

2. In the quantitative analyses of FIA data, we selected 2005 and 2015 as reference years as they represent the closest available summaries of the FIA census relative to our reference date of 1 January 2008 and the present.

3. The area of plantations actually occurring on Category 2 lands is likely overstated by applying forest ownership ratios for all forested lands due to the low percentage of family forest owners who list timber production as a priority for ownership (NWOS), and our qualitative analysis indicates plantations are more likely to occur on other ownerships (Zhang, et al, 2012).

INDICATOR 7.3.2 The areas scheduled for conversion shall total less than 5% of the total area of the FMU as of 1 January 2008.

INDICATOR 7.3.2 RISK RATING	Specified risk for the sixty-seven counties in the RBA region with greater than 5% forest loss between 2005 and 2015 (according to FIA data), or that were designated with specified risk by the FSC US CW NRA. Low risk for the remaining 175 counties within the RBA region.
ALTERNATIVE MEANS OF VERIFICATION	Yes. See Assessment Methodology section for Indicator 7.3.1.
MITIGATION (IF NEEDED)	To address specified risks for conversion, pellet producers must implement a 2-part mitigation measure combining: (1) use of LMPs and (2) the engagement of family landowners owning currently forested properties and continued management resulting in the retention of forest. Pellet producers need not mitigate in each of the counties of specified risk that intersect with their roundwood sourcing regions but must account for the total Category 2 forest area represented in those counties to scale their mitigation accordingly. Specific mitigation requirements for this indicator are outlined below and, more broadly, in the RBA's mitigation section

MITIGATION REQUIREMENTS

Landscape Management Plan Use:

The use of the LMP and the management to support forestland retention at the property level, combined with monitoring over the duration of RBA use and verification of volumes by a pellet producer, serves as demonstration of action to retain the forest.

The SDE+ requirements include specifications for management plans, which can only be achieved using landscape management plans, given the costs and limitations of individual management plans, as well as their limited adoption by Category 2 family landowners in the United States. (See Annex IV for an overview of LMPs.) As such, all RBA users are reliant on the development, implementation, monitoring, maintenance, and improvement of LMPs.

At the mill level, pellet producers must demonstrate that a Category 2 land area, commensurate with the production of the specified volume of pellets (see *Calibrating Thresholds for Mitigation* above), is newly enrolled for management under the LMP in the year the wood is harvested and related SDE+ conformity year statement timeframe. A pellet producer must maintain the previous year's LMP enrolled land base, while adding new acres under LMP management in their current year, for the duration of their use of the RBA and approved use of the VP under Dutch law. The pool of acres managed under the LMP must be maintained and verified in monitoring (outlined below). In the case that, though annual monitoring by AFF, it is observed that acres enrolled in a past year are removed from LMP, the pellet producer must recruit additional, new acres under LMP use to compensate.

LMPs that comply with the SDE+ requirements for management plans were established (in Georgia and South Carolina) or augmented (Florida) in each of the states within the scope of this RBA over the course of 2020. This is a first stage of the mitigation. RBA users must provide monetary support to AFF for LMP maintenance, including engagement and training amongst the broader community of foresters and technical service providers, necessary revisions, technological updates, and other critical activities.

Unit of mitigation:
Acre recruited and under management supported by LMP use within the sourcing region.

Evidence provided by pellet producer:
- Documentation of LMP establishment (2020)
- Documentation of financial support to AFF for implementation and maintenance of LMPs applying to their roundwood sourcing area
- Documentation (using standardized format and platform) of Category 2 acres recruited for management under LMP based on calibration of required land area to produce claimed SDE+ volume per year, per *Calibrating Thresholds for Mitigation* section. Documentation includes landowner name, location of property, number of acres recruited and date of subscription to management under the LMP.
- Documentation of aggregated, retained Category 2 acreage pool under LMP management, including newly recruited replacement acres, if there is attrition of Category 2 acres from LMP supported management.
- Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating the effectiveness of this mitigation measure. As such, RBA users must provide AFF with standardized documentation of LMP use within their roundwood sourcing regions and secure egress to landowners' properties for monitoring. Monitoring will include confirmation that forest management, as supported by the LMP is continued. Though it is not required, this may occur with the greatest ease and lowest cost through the ATFS program for subpopulation sampling. RBA users must provide monetary support for this function to AFF and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

Monitoring and effectiveness evaluation:

To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating the effectiveness of this mitigation measure. As such, RBA users must provide AFF with standardized documentation of mitigation activities within their roundwood sourcing regions and secure egress to implementing Category 2 landowners' properties for monitoring. RBA users must provide monetary support for this function and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits

ASSESSMENT METHODOLOGY

See above methodology for Indicator 7.3.1.

ASSESSMENT OF COMPLIANCE

Between 2005, which is the nearest FIA measurement prior to the benchmark year of 2008, and 2015, which represents the most recent complete set of FIA data, the total forest area within the RBA declined by 528,635 acres, or 1.1%. During that same 10-year period, the planted area within the RBA declined by 825,255 acres, or 5.1%. This data represents all ownership classes.

FIA data for ownership classes shows that 45% of the forested area within the RBA region is classified as family forests (Florida 23.96%, Georgia 51.75%, South Carolina 52.48%) (Hewes et al, 2017). When applied to state level changes in total forest area within the RBA since 2005, total family forest area declined by 256,159 acres, or 1.1% of the family forest area present in 2005.

By applying the state level family forest ratios for all forests to planted areas during that same 10-year period, the planted area on family forest lands within the RBA declined by 259,862 acres, or 3.7%. However, research indicates that plantations in the US South are disproportionately located on industry lands with 10% of forest ownership in REITs and TIMOs, yet 26% of plantations occurring on those same lands (Zhang, et al, 2012). As further evidence that "wood plantations" are relatively uncommon on Category 2 lands, only 15% of all family ownerships report that production of timber products is "very important" as a reason for owning their land (Butler, et al. 2020, Southeast, Table 7). Hence, the area of plantations actually occurring on family forest lands is likely overstated by applying forest ownership ratios for all forested lands.

FIA data show that both the total loss in forest area on family forest lands and loss in planted stands is less than 5%, therefore we find the risk of noncompliance to Indicator 7.3.2 is low when measured across the entire RBA. However, out of a total of 242 counties within the RBA region, the FSC US CW NRA, which uses a different methodology, has identified 20 counties designated with specified risk for conversion. Out of those twenty counties designated by FSC as having specified risk, the FIA data shows only eight counties (3% of all counties in the RBA region) where FFO forest lands experienced net forest loss of greater than 5% between 2005 and the most recent FIA measurement in 2015. See Risk Assessment Table VI below. Virtually all the net forest loss in the counties designated with specified risk can be attributed to the counties with forest loss exceeding 5% since 2005. However, when analyzing FIA data for changes in forest land on all counties in the RBA region, we find an additional 55 counties show net forest loss greater than 5% from 2005 to 2015. Taking a precautionary approach, our assessment is that all counties designated with specified risk in the FSC US CW NRA and all counties where FIA data indicates net loss in forest area greater than 5%from 2005 to 2015 should be designated with specified risk in the RBA. As noted above, 8 of 20 counties assigned a specified risk for conversion in the FSC US CW NRA also showed greater than 5% net loss according to FIA data.

Risk Assessment Table VI: Change in forest area within counties designated as specified risk by the FSC US CW NRA

STATE	COUNTY	FFO % of Total Forested	FFO Forested Area (Ac.)		Change in FFO Area 2005 - 2015	
			2005	2015	Area (Ac.)	Percent (%)
Florida	Clay	16.11%	46,525	47,111	586	1.3%
Florida	Flagler	16.21%	36,736	35,526	-1,211	-3.3%
Florida	Nassau	19.70%	58,004	56,329	-1,674	-2.9%
Florida	Santa Rosa	12.93%	500,342	501,795	188	0.3%
Florida	*St. Johns*	*13.12%*	*33,001*	*30,969*	*-2,032*	*-6.2%*
Florida	Volusia	14.69%	455,190	460,097	4,907	1.1%
Georgia	*Barrow*	*77.20%*	*44,807*	*36,408*	*-8,399*	*-18.7%*
Georgia	*Bryan*	*27.89%*	*58,340*	*55,309*	*-3,031*	*-5.2%*
Georgia	*Cherokee*	*60.10%*	*101,547*	*82,991*	*-18,556*	*-18.3%*
Georgia	Clayton	6.37%	1,309	1,347	38	2.9%
Georgia	*Columbia*	*69.03%*	*76,775*	*69,178*	*-7,597*	*-9.9%*
Georgia	Effingham	63.27%	151,831	147,255	-4,577	-3.0%
Georgia	Forsyth	79.36%	46,051	51,371	5,321	11.6%
Georgia	Henry	68.65%	63,941	63,978	36	0.1%
Georgia	*Paulding*	*39.25%*	*50,454*	*46,254*	*-4,200*	*-8.3%*
South Carolina	Berkeley	16.13%	94,554	91,179	-3,375	-3.6%
South Carolina	Horry	35.79%	164,473	169,468	4,995	3.0%
South Carolina	Jasper	37.94%	116,582	117,108	526	0.5%
South Carolina	*Lancaster*	*56.73%*	*158,715*	*148,752*	*-9,963*	*-6.3%*
South Carolina	*York*	*54.19%*	*158,134*	*141,196*	*-16,938*	*-10.7%*
All Counties		**31.68%**	**1,593,333**	**1,524,192**	**-69,141**	**-4.3%**
Counties <5% loss		**25.82%**	**911,561**	**913,134**	**1,574**	**0.2%**
Counties >5% Loss		***45.48%***	***681,773***	***611,058***	***-70,715***	***-10.4%***

Source: Forest Inventory and Analysis (FIA) Database. Most Recent FIA Data by State and Collection Year

Note: Counties with net loss exceeding 5% from 2005 to 2015 are identified with red, italicized text.

Based on the data presented above, specified risk is assigned to a total of 67 counties [55 + (20 – 8)] in the RBA region with greater than 5% forest loss between 2005 and 2015, or were designated with specified risk by the FSC US CW NRA. Low risk for the remaining 175 counties within the RBA region. A list of counties designated with specified risk can be found in Appendix IV.

DISCLAIMERS AND CONSIDERATIONS:

1. In the quantitative analyses of FIA data, we selected 2005 and 2015 as reference years as they represent the closest available summaries of the FIA census relative to our reference date of 1 January 2008 and the present.

2. The area of plantations actually occurring on Category 2 lands is likely overstated by applying forest ownership ratios for all forested lands due to the low percentage of family forest owners who list timber production as a priority for ownership (NWOS), and our qualitative analysis indicates plantations are more likely to occur on other ownerships (Zhang, et al, 2012).

3. The FSC CW NRA uses a different methodology than that used in this RBA's assessment for risk, thus, producing different results.

4. In our analysis for conversion of forest to other land uses we considered employing data from the National Land Cover Database. As a result of our own comparative evaluation as well as consultation with experts, we conclude that NLCD, while an excellent tool for many purposes, is less reliable than the FIA for identifying forests converted to other land uses. Our conclusion is largely based on the following: a) NLCD does not utilize a "use" based definition of forest and instead relies exclusively on defined site characteristics. For example, all three classifications for forest (deciduous, evergreen, mixed) are defined, among other characteristics, by trees greater than 5 meters in height, which clearly excludes young regenerating forests. b) two NLCD land classifications (shrub/scrub and grasslands/herbaceous) are certain to include young regenerating forests. In fact, the definition of shrub/scrub states that it "includes young trees in early successional stages". In aggregate, these two cover types represent 93% of the forest area identified using NLCD as "converted" between 2008 and 2016. Consequently, the inclusion of these cover types in an assessment of land use conversion introduces considerable uncertainty into the results. c) remote sensing products like NLCD are 'point in time' maps which inherently do not include information about reforestation or recovery and are therefore essentially incapable of reliably differentiating non-forest from young forest. d) the data provided for total forested area within the RBA region is significantly less than the results provide by FIA data (roughly 61% of the forest area reported by FIA), again introducing uncertainty about the overall reliability of the data. As a result of this evaluation, we have concluded that FIA is a more reliable source for assessing risk of conversion and have therefore elected to not use NLCD as a source for the assessment of Criterion 7.3.

5. While noted elsewhere, we caution against the use of county level analyses, due to analytical and data limitations at finer scales, we felt it was appropriate to do so in this case, based on multifaceted assessment and corroborating considerations.

INDICATOR 7.3.3 The areas scheduled for conversion do not damage or threaten any site of high conservation value.

INDICATOR 7.3.3 RISK RATING	Specified risk for 155 counties that overlap Critical Biodiversity Areas and Primary Forest Types designated in the FSC CW NRA. Low risk for the remaining 87 counties.
ALTERNATIVE MEANS OF VERIFICATION	Yes. See Assessment Methodology section for Indicator 7.3.1.
MITIGATION (IF NEEDED)	See mitigation requirements outlined for 7.1.

ASSESSMENT METHODOLOGY

See above methodology for Indicator 7.3.1.

ASSESSMENT OF COMPLIANCE

The FSC US CW NRA has identified several forest areas within the RBA Region with specified risk for high conservation values (HVCs) potentially threatened by management activities. HCVs at risk include species diversity and rare ecosystems located in portions of all three states in the RBA region. Specified risk is designated for four Critical Biodiversity Areas, and three "priority forest types".

Habitat for one species, the patch-nosed salamander, is also designated as specified risk in the FSC US CW NRA. The US FWS was formally petitioned in 2010 by the Center for Biological Diversity (CBD) to protect the patch-nosed salamander under the Endangered Species Act. However, after further consideration, the CBD withdrew their petition in 2018. Consequently, we are designating low risk for habitat of the patch-nosed salamander in the RBA.

The areas supporting HCVs threatened by management activities within the RBA region are listed in Risk Assessment Table VII. Maps identifying the location of these areas and a list of counties that overlap with specified risk areas are available on the FSC US CW NRA webpage. The majority of counties within the RBA region (155 of 242, or 64%) overlap one or more designated risk area: all 37 counties in Florida; 89 of 159 counties in Georgia; and 29 of 46 counties in South Carolina. Each county overlapping areas designated with specified risk contain Category 2 lands.

Risk Assessment Table VII: FSC US CW NRA areas designated as specified risk for HCVs, overlapping counties within the RBA region.

Areas with designated risk for HCVs	FL	GA	SC
Central Appalachian Critical Biodiversity Area	0	7	0
Southern Appalachian Critical Biodiversity Area	0	7	0
Florida Panhandle Critical Biodiversity Area	14	2	0
Central Florida Critical Biodiversity Area	5	0	0
Mesophytic Cove Sites	0	10	0
Late Successional Bottomland Hardwood Sites	36	70	28
Native Longleaf Pine Systems	17	22	14

Note: Numbers indicate the number of counties in each state that overlap each designated area. Some counties overlap with multiple HCVs designated with specified risk and are therefore counted more than once.

Because Category 2 forest lands exist in all counties that overlap with areas designated by the FSC US CW NRA as specified risk for threatened HCVs, we are designating those counties as specified risk.

CRITERION 7.4 **In the case of wood plantations, there is a preference for native species, and a relevant percentage of the plantation must be able to revert to natural forest at a later stage.**

INDICATOR 7.4.1 In the case of wood plantations, it is demonstrated through documented trials that the selection of species for planting is based on their overall suitability for the site and their appropriateness to the management objectives.

INDICATOR 7.4.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	None

ASSESSMENT METHODOLOGY

We cite the conclusions drawn for Criterion 3.3 that demonstrate a low probability of "wood plantations" being established on Category 2 lands within the RBA region. We reference relevant results of AFF's stakeholder consultation questionnaire. Consultation with experts including Dr. Scott Enebak. We conducted a quantitative assess of standing tree volume by species within the geographic scope of the RBA using FIA data to support risk evaluation. In addition, we conducted qualitative assessment, using expert consultation and stakeholder feedback.

EVALUATION OF COMPLIANCE:

As noted under Criterion 3.3, the presence of "wood plantations" as defined by use of exotic species and/or intensive management practices is rare on Category 2 lands within the RBA. As such, since this Criterion and Indicator specifically reference species selection on "wood plantations", the risk of non-compliance to Indicator 7.4.1 is low due to the relative absence of "wood plantations" on small lands.

Additionally, according to Dr. Scott Enebak, Director of the Auburn University Southern Forest Nursery Cooperative, all the species produced by the 17 members of the Cooperative and an additional 36 private tree seedling nurseries, were native to the southeastern United States. As such, commercial availability of tree seedlings is largely limited to native species.

Because reforestation, particularly tree planting, is a considerable investment, there is an inherent incentive for landowners to select species that match their objectives and are suitable for site conditions. Nurseries that serve landowners in the RBA region, many of them members of the Southern Forest Nursery Cooperative, source seeds and/or develop seedlings through repeated trials that are adapted to the region's soils and climate. Guidance is provided to landowners and foresters for selection of species. As an example, the Georgia Forestry Commission produces a seedling brochure with seedling descriptions and recommendations for applicable geographic regions. Similarly, the Florida Forest Service provides seedlings for sale to family forest owners and provides guidance on where each species should be planted. All species offered for sale are native to Florida. All three state forestry agencies within the RBA region provide useful resources on reforestation, available to family forest owners at no cost. Several cost share programs are also available to incentivize landowners to plant trees, complete with technical assistance to ensure proper alignment of species, management objectives and site conditions.

Finally, AFF distributed a survey questionnaire to over 23,000 entities as part of an independent stakeholder consultation process in May 2020.   Over 300 responses were received and a total of 89 stakeholders indicated an interest in one or more of the three states located within the RBA region (FL, GA, SC). The questionnaire asked stakeholder whether they agree that, in the case of plantations, family forest owners demonstrate a preference for native species. A strong majority (71%) of respondents to this question agreed with the statement, with only 10% in disagreement. The remainder were neutral or had no opinion. Three of four respondents identifying themselves as being affiliated with an environmental organization agreed, with one being neutral on the subject. These results reinforce the evidence presented above.

Given the low incidence of "wood plantations" on category 2 lands, the general lack of availability of non-native species for tree planting, ample availability of technical guidance and the inherent incentive to select species that match objectives and site conditions, and stakeholder results from the AFF questionnaire, the risk of non-conformance to Indicator 7.4.1 is low.

DISCLAIMERS AND CONSIDERATIONS
N/A

INDICATOR 7.4.2 Any choice to use exotic species and genotypes must be clearly justified.

INDICATOR 7.4.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	None

ASSESSMENT METHODOLOGY
We conducted a quantitative assess of occurrence by area (acres) for species groups within the geographic scope of the RBA using FIA data to support risk evaluation. This allowed us to identify the occurrence of introduced species (i.e., exotic hardwood and tropical hardwoods). Consultation with experts including Dr. Scott Enebak. In addition, we conducted a qualitative assessment using expert consultation and stakeholder feedback.

ASSESSMENT OF COMPLIANCE
To assess the extent of introduced species, we analyzed species occurrence (area) in the FIA data on all ownerships the selected geography. We isolated the introduced species groups reported in FIA, specifically tropical hardwoods, and exotic hardwoods. Our analyses found that these species groups are reported only in 13 of the 242 counties in the scope of our RBA. In these counties, none register these species groups as more than 2.5% of total forest area. When the family forestland ownership ratio is applied to these counties, the area in these non-native species groups drops to below 1% in all counties. Interviews with stakeholders corroborate this finding. Thus, as a defining factor for plantations, use of introduced species is determined to be a nonissue on Category 2 lands in this geography.

We also investigated seedling production with Dr. Scott Enebak, Director of the Auburn University Southern Forest Nursery Cooperative. The mission of the cooperative is 'To develop and disseminate available cultural, biological and chemical technologies using an integrated system for the economical production and utilization of forest tree seedlings in the southern United States.' Cooperative member forest tree seedling nurseries in the southern United States produce approximately 70% of all the tree seedlings grown in the United States. According to the cooperative's annual report on seedling production in the south (2018), which includes not only the 17 members of the Cooperative but an additional 36 private tree seedling nurseries, a total of 1,040,415,000 seedlings were produced for planting on reforestation and afforestation tracts. All the species produced were native to the southeastern United States. According to Dr. Enebak, only one exotic species, Eucalyptus, was produced in small quantities for application on forest industry lands for a few years. The production of this species trended upward for a few years to a high of 1.5 million (enough for planting around 2,500 acres total (1,011 ha.), but now is not being reported as produced. At its height of production, this exotic species was only .0014% of total seedling production in the South, further corroborating our analyses.

Finally, as noted above in Indicator 7.4.1, results from AFF's stakeholder consultation in May 2020 indicate a majority of respondents agree that family forest owners demonstrate a preference for native species when planting trees.

With clear evidence that at most a tiny fraction of standing trees are potentially exotic species and genotypes, that limited use of exotic species was essentially confined to industry lands, and only native species suited to the local conditions and management regimes within the geographic scope of the RBA are currently being produced and planted, we determine that the risk for this protocol is Low.

CONSIDERATIONS AND DISCLAIMERS

1. We cannot conclusively link trends observed to family woodlands specifically.

INDICATOR 7.4.3 Representative samples of existing natural ecosystems, which shall cover at least 5% of the area of the FMU, are managed so as to retain them or restore them to their natural state, based on the identification of key biological areas, consultation of stakeholders, local government and scientific authorities.

INDICATOR 7.4.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	None

ASSESSMENT METHODOLOGY

Using the Risk Based Approach, Category 2 FMUs do not need to undergo individual verification. The Indicator explicitly references FMU-level evaluation which is virtually impossible given several hundred thousand Category 2 landowners exist within the RBA (Butler, et al). Therefore, we use an "alternate means of verification" as permitted under the SDE+ Verification Protocol to evaluate risk on Category 2 lands across the entire RBA. We first reference quantitative and qualitative analysis completed for Criterion 3.3 which concluded a low probability for the existence of "wood plantations" on Category 2 lands within the RBA. Since Criterion 7.4 is

intended to address conditions relating to "wood plantations", and since the existence of "wood plantations" has been shown to be unlikely on Category 2 lands, the risk for sourcing biomass from "wood plantations" on Category 2 lands is low. This risk rating would de facto also apply to the risk of sourcing biomass from "wood plantations" where less than 5% of the area of the FMU is managed to retain or restore them to their natural state. While we feel the above analysis strongly indicates low risk for the overwhelming majority of family landowners with holdings smaller than 500 hectares, to further assess risk we conducted a quantitative analyses of FIA data showing the total area by forest species group. We then applied the family forest ownership ratios by county to approximate area by cover type on Category 2 lands. We also reference similar data for the 13-state southeastern region reported in the Southern Forest Futures Project technical report.

Lastly, we consulted with experts and other stakeholders with knowledge of trends and behaviors of family forest owners within the RBA.

ASSESSMENT OF COMPLIANCE

FIA plot data is used to identify area and volumes to establish forest cover types at the county level. The FIA data assigns a species grouping to each plot, and subsequently arrives at estimates for area and volume for all applicable species groups. These species groups can reasonably be considered proxies for the full spectrum of ecosystems represented in a given geography. The two preferred species for plantations in the RBA region are loblolly pine and slash pine. To a far lesser extent, longleaf pine is planted for restoration purposes and would not qualify as a "wood plantation." The two cover types including loblolly and slash pine include both planted and natural stands. Using the most current FIA data for volume by cover type, Risk Assessment Figure II shows most of the volume (56%) is located in forest cover types that do not typically include plantations. These species groups, comprised mainly of hardwoods, can reasonably be viewed as naturally occurring ecosystems. This information shows clearly that greater than 5% of forests within the RBA region are representative of natural ecosystems.

Risk Assessment Figure II: Distribution of volume by forest cover type within the RBA region, all ownerships.
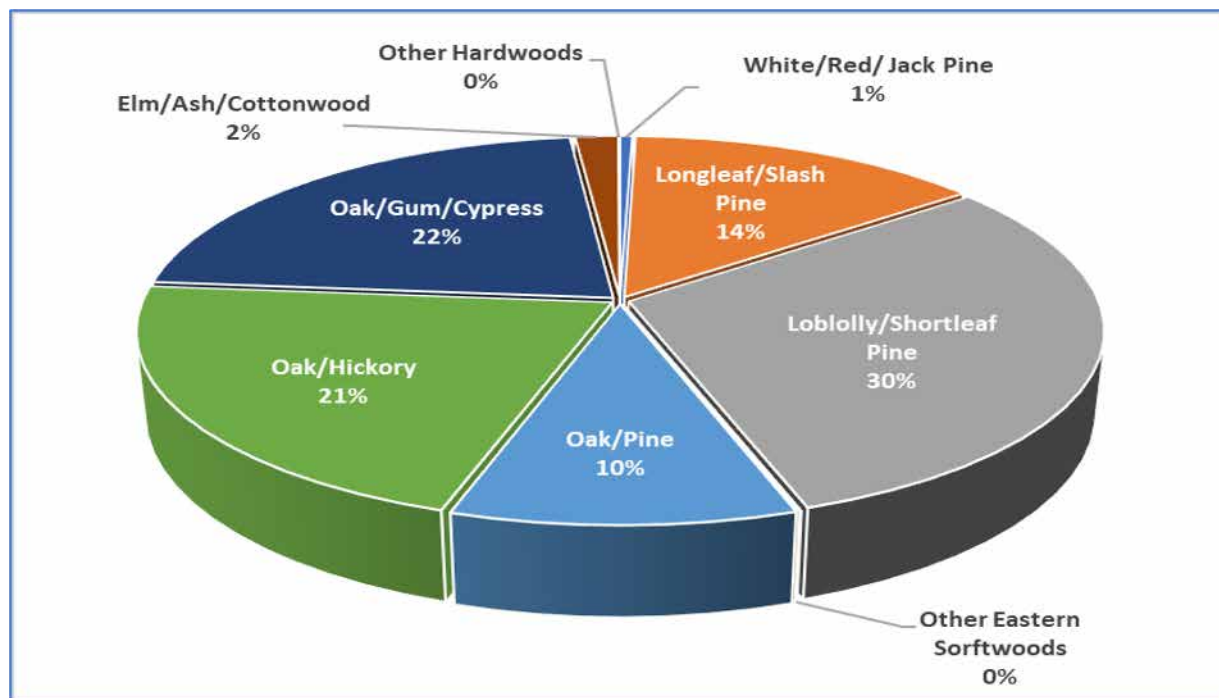
Lastly, we applied family forest ownership ratios to the distribution of area (ac.) by forest cover type for each county in the RBA region using the most recent FIA data. We then summarized these results for each state and the RBA region as a whole to approximate the amount of Category 2 forestland occupied by the full spectrum of forest types. The acreages reported for Loblolly/Shortleaf pine and Longleaf/Slash pine include both planted and natural stands, and therefore the planted area in Category 2 forestland is actually lower than the total area represented for these two species groups. As shown in Risk Assessment Table VIII, the majority of Category 2 land, conservatively estimated at 69% of total forest area, is comprised of representative samples of native ecosystems.

Risk Assessment Table VIII: Estimated area of Category 2 lands within the RBA by forest type. Source, USFS FIA.

SPECIES GROUP	FL	GA	SC	TOTAL	% TOTAL
Elm/Ash/Cottonwood Group	4,598	79,318	65,899	149,814	1%
Loblolly/Shortleaf Pine Group	279,208	5,015,332	4,868,840	10,163,380	38%
Longleaf/Slash Pine Group	2,044,658	2,525,616	209,519	4,779,793	18%
Maple/Beech/Birch Group	44	223	0	268	0%
Oak/Gum/Cypress Group	588,616	1,877,234	1,385,108	3,850,959	14%
Oak/Hickory Group	259,200	3,627,344	1,636,622	5,523,167	21%
Oak/Pine Group	189,817	1,745,538	472,867	2,408,222	9%
Pinyon/Juniper Group	0	48	2,845	2,893	0%
White/Red/Jack Pine Group	0	12,364	10,275	22,639	0%
TOTAL	3,366,142	14,883,018	8,651,974	26,901,134	100%

Note: the tropical hardwoods and exotic hardwoods groups have been excluded as in combination they represent an estimated 0.0442% of family forest lands within the RBA forest area, and neither species group is likely to occur on Category 2 lands (See Criterion 3.3).

These data are further corroborated by the Southern Forest Futures Project technical report which states that, across the 13-state southeastern region (including all of the RBA region), 55% of forest land is occupied by hardwoods, 1% by an oak/pine mix, 15% by natural pine and 19% by pine plantations. (Wear, et al, pp. 10 – 11)

The FIA species groups are the result of a scientifically rigorous process that has been continuously refined since its inception in the early 1930's. The FIA dataset, as well as the scientists who manage the FIA program, are held in high regard as evidenced by the frequency with which the data is cited in published reports and research papers (Czaplewski, 2004). The forest types and species groups have been developed as a geospatial dataset the USFS FIA program in collaboration with the Geospatial Technology and Applications Center (GTAC). The dataset was created by modeling FIA plot data "as a function of more than one hundred geospatially continuous predictor layers". (https://data.fs.usda.gov/geodata/rastergateway/forest_type/). The species groups defined by the FIA Program have been used by the USFS, as well as many other diverse users including conservation organizations, academia, state and local governments and others. As the authoritative resource, FIA and the species groups have been rigorously tested by scientific authorities over time and are subject to public review and stakeholder feedback, as are all dimensions of USFS programming.

Lastly, the stakeholder consultation conducted by AFF in May 2020 asked stakeholder whether they agree that "a relevant percentage of the wood plantation area on family and small forestlands is able to revert to a natural forest at a later stage". Fifty-six percent of respondents to this question who expressed interest in the RBA region were in agreement, with 21% disagreeing and 25% were neutral or had no opinion.

In summary, the risk of non-compliance with Indicator 7.4.3 is low for the following reasons:

1. There is a low probability for the existence of "wood plantations" on Category 2 lands within the RBA;

2. The majority of family-owned forest lands (conservatively estimated at approximately 69%) are comprised of hardwood, mixed pine/hardwood, natural pine, and other forest types that are representative of naturally occurring ecosystems.

3. For family forest owners that do have plantations, by almost a 3:1 margin, stakeholders agree that a relevant amount of planted stands are able to revert to natural forest conditions.

DISCLAIMERS AND CONSIDERATIONS:

1. We did not apply a family forest ownership ratio to FIA volume data because the ownership data are derived using area and are not directly transferable to volumes.

2. We excluded both tropical hardwoods and exotic hardwood species groups from the acreages reported for species groups because they represent an insignificant area within the RBA, particularly when applying family forest ownership ratios. Similarly, these two species groups are not included in the reported volumes.

CRITERION 7.5 **Exploitation of non-timber forest products, including products from hunting and fishing, is regulated, monitored and controlled to safeguard the maintenance of the biodiversity in the forests.**

INDICATOR 7.5.1 The forest manager identifies and complies with all legal requirements applicable to the management and/or collection of the non-timber forest products in question, including CITES.

INDICATOR 7.5.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Qualitative analysis based on legal requirements for management and/or collection of non-timber forest products, including hunting and fishing. Analysis of the legal requirements and processes surrounding CITES within the RBA geography, as well as Category 2 landowner's attitudes and the common practices of collection of non-timber forest products.

ASSESSMENT OF COMPLIANCE:

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank.

The United States operates under a robust set of laws and regulations related to hunting, fishing, and trapping in each state. Under the doctrine of public trust, all the people of a state, represented by the state government, are the collective owners and have responsibility for all wildlife occurring within its boundaries. Exceptions to this state ownership and responsibility are for wildlife occurring on land owned by the federal government, species noted in international treaties or protected under federal law, which become federal trust wildlife. Another exception to the state public trust doctrine is wildlife occurring on tribal lands, which fall under the purview of the native tribe and/or the US Department of Interior, Bureau of Indian Affairs. This public trust doctrine, which has been affirmed by the judicial system in the United States, allows the passage of laws and regulations that forbid or control the time, place, and manner of the private taking of various mammals, fish and birds within a state.

Permits (licenses) are required in each state for anyone over the age of 16, including Georgia, Florida, and South Carolina to hunt and fish (refer to state hunting and fishing regulations) and each of the state governments have wildlife law enforcement actively enforcing the rules and regulations concerning hunting, fishing and trapping. Extensive publications on hunting, fishing, and trapping laws and regulations are published and widely available, both in print on online, for public consumption annually.

The NWOS of family forest owners in the southeast US indicates that 78% of owners are concerned or greatly concerned with trespassing or poaching of wildlife and 63% of the family forest owners in the southeast covering 80% of the family forest acres, post or mark their land with signage against trespass and/or illegal hunting. This shows a strong compliance attitude toward legal hunting and fishing.

The NWOS survey also indicates that a small percentage, 5%, of family forest owners in the southeast US harvest non-timber forest products for sale, while only 26% harvest non-timber forest products for personal use. This small percentage of family forest owners indicates a low risk of exploitation of NTFPs on private lands within the southeast including the geography of this RBA.

In AFF's independently conducted stakeholder consultation in May 2020, stakeholders were asked to describe the effectiveness of "regulating, monitoring and controlling collection of non-timber forest products, including products from hunting and fishing". A total of 73 responses were received from stakeholder expressing interest in the RBA region. Only 7% (n = 5) of responses indicated current measures to protect NTFPs were inadequate, while 70% described existing measures as adequate to "very well developed". The remainder were neutral or had no opinion. When coupled with results from the NWOS, it appears that while a minority of family forest owners collect NTFPs on their lands, most are concerned about protecting their land from illegal activity and a majority of stakeholders have confidence in existing measures to protect and conserve NTFPs.

There are several examples of laws and regulations in the RBA geography concerning specific NTFPs. The first is a Georgia Statute concerning pine straw. In 2012, pine straw accounted for 9.6 percent of Georgia's forest products market at $59 million. According to Risher Willard of the Georgia Forestry Commission, the statute addresses the illegal harvest and chain of custody of this NTFP requiring a certificate of legal harvest from the harvester, dealer, and seller of pine straw. The statute gives enforcement authority to the Director of the Georgia Forestry Commission who can stop the sale, stop use, and seize the pine straw. Anyone guilty of violation can be charged with a misdemeanor crime. Florida has a statute requiring a permit from the Florida Department of Agriculture to harvest an extensive list of 'regulated plants.' Saw palmetto, the most common palm in Florida (Chamberlain et al, 2018, pp 246) is included on this list as the berries are one of the more extensively harvested NTFPs in the

southern coastal plain of the United States. Legislation declared the saw palmetto berry an agricultural crop and protects it from unauthorized harvesting anywhere it is found. The legislation authorizes sanctions against those found harvesting berries without permission from the landowner (Chamberlain et al, 2018, pp 168).

Finally, American ginseng is found in the northernmost counties in the state of Georgia. In 1975, American ginseng was listed in Appendix II of the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) an agreement to which the United States is party. The U.S. Fish and Wildlife Service (FWS) is the implementing agency for the United States and is charged with determining if the export of ginseng root as well as all other CITES listings would be detrimental to the survival of the species and certifying that states that want to export ginseng have an acceptable management and monitoring program. Because of the United States adherence to CITES, there are nearly 40 years of harvest data by state and county for ginseng. More is known about the harvest of American ginseng than any other medicinal forest product. (Chamberlain et al, 2018, pp 16-17) Small amounts of ginseng come from within the geography of this RBA. Harvest data from 2013 show the amount of American ginseng from Georgia at 346 pounds of the 75,892 pounds harvested, or less than .5% of the total.

The Forest Stewardship Councils Controlled Wood National Risk Assessment (FSC-CW-NRA) finds that a low-risk threshold applies to the United States concerning CITES. The FSC-CW-NRA states, 'Identified laws are upheld. Cases where law/regulations are violated are efficiently followed up via preventive actions taken by the authorities and/or by the relevant entities. No North American tree with commercial timber value is listed in the CITES Appendices.' As well, the US FWS submits to the CITES Convention regular reports on the United States implementation of CITES.

There is a strong adherence to the rule of law in the United States as evidenced by high ratings for Rule of Law and Control of Corruption issued by the World Bank. Hunting and fishing are well-regulated, and enforcement is proactive. There are few laws and regulations established for other NTFPs within the RBA geography, but few of the family forest owners harvest NTFP from their property. NWOS results also show family forest owners express strong concern for protection of wildlife and their properties from illegal activities. CITES is implemented in the United States. Given this assessment, we find there is a low risk for of non-conformance to this indicator.

DISCLAIMERS AND CONSIDERATIONS:
NA

PRINCIPLE 8: THE REGULATING EFFECT AND THE QUALITY, HEALTH AND VITALITY OF THE FOREST ARE MAINTAINED AND WHERE POSSIBLE ENHANCED

CRITERION 8.1 The soil quality of the forest management unit is maintained and if necessary improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes.

INDICATOR 8.1.1 Specific measures have been taken to maintain and if necessary, improve the soil within the FMU in terms of structure, fertility, and biological activity. As a minimum, site preparation and harvesting methods within the FMU shall have been designed to minimise soil compaction and maximise the retention of nutrients on-site.

INDICATOR 8.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

Because Indicator 8.1.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature and results from stakeholder engagement. Refer to BMP Overview section.

EVALUATION OF COMPLIANCE:

Retaining soil on the forested landscape is important to both forest productivity and pollution control, including the retention of nutrients in the site. Sediment is considered one of the most substantial water pollutants associated with forestry activities. (Yoho, 1980)

Best management practices (BMPs), as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on soils and water features.

Established BMPs for each of the states in the scope of this RBA include measures for site preparation and harvesting practices that are designed to minimize soil disturbance and compaction, which support soil structures, fertility, and biological activity, as well as measures to reduce deposition and promote retention of sediment and nutrients onsite.

These programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA. As outlined in the RBA's BMP overview, BMP training programs are widely used in each of these states, elevating use of the suite of BMPs. This suggests an extremely high rate of implementation and assurance that measures to minimize soil compaction and maximize nutrient retention have been taken.

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

Although forest certification systems have thus far not been adopted on a significant proportion of the RBA region, and therefore typically are not considered to materially reduce risks associated with forest management activities at the scale of the RBA, one exception is the influence of BMP implementation by the SFI Fiber Sourcing program, which is designed to address forest management practices on non-certified lands within the supply areas of participating mills. As an example, in 2015 at least 81% of the forest area in Georgia fell within the sourcing areas of mills participating in the SFI Fiber Sourcing program. Because BMP compliance is a requirement of the SFI Fiber Sourcing standard, BMP implementation is positively influenced on timber harvests supplying SFI certified mills. Between 2002 and 2015, BMP implementation was on average 2% higher within the wood baskets of certified mills than outside those sourcing areas. (Dwivedi et al, 2018)

AFF distributed a questionnaire in May 2020 seeking stakeholder perspectives on a range of sustainable forest management issues. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted. For stakeholders who expressed an interest in one or more of the three states located within the RBA region (FL, GA, SC), 86.7% either agreed or strongly agreed that soil quality is maintained and, if necessary, improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes on family forest lands. These results strongly indicate confidence among stakeholders that family forest owners are applying appropriate control systems for maintaining soil health.

Effectiveness of BMPs is well documented and widely accepted, nationally and in the US South. The proper use of forestry BMPs have been reported to improve water quality 80-90% above prior practices as well as reducing deposition of sediment, nutrients, and organic matter. (Walbridge, 1993)

Based on the inclusion in state BMPs of measures to minimize impacts to soils and present sediment deposition, widespread use of BMPs, their demonstrated effectiveness, requirements for BMP use by biomass suppliers and information about landowner attitudes toward water, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.1.2 All forestry operations within the FMU with a potential negative environmental impact, with an emphasis on watershed protection (e.g., coasts, riverbanks), areas susceptible to erosion and slopes, are accompanied by appropriate control systems and procedures. Control systems are based on national or regional best practices with regard to erosion and sediment control, minimisation of forest damage during harvesting, road construction and other mechanic disturbances under specific weather conditions (all-weather harvesting vs dry weather harvesting).

ASSESSMENT METHODOLOGY

INDICATOR 8.1.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	N/A

Because Indicator 8.1.2 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature; stakeholder engagement. Refer to BMP Overview section. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

Forestry best management practices (BMPs), as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on soils and water features.

The BMPs that guide forestry activities in the states covered by the RBA are designed to minimize negative impacts, overall, and promote watershed protection through measures to reduce erosion, residual damage, construct and maintain forest roads, and provide guidelines for weather and seasonality of harvesting conditions.

Each state's BMPs specify practices a range of practices to minimize impacts from roads by maintaining existing road infrastructure. For new road construction, each state's BMPs include provisions for appropriate width to support equipment, locations (including grade, aspect, sunlight exposure and other factors) to minimize deposition and other factors.

To minimize residual damage to the site, all three state's BMPs include provisions such as Streamside Management Zones (SMZ) that guide the width of streamside buffer areas, residual basal area, or trees to be left and ground cover to remain intact, depending on the order of the stream. Vegetative seeding rates are recommended for logging decks and temporary road close out as well as BMPs for pesticide and fertilizer application, handling, and clean up.

All these state's BMP manuals contain erosion control measures such as SMZ's to capture any sediment runoff, specific recommendations for road water bar structures and turnouts, stream crossing entrance and exit specifications and recommendations, as well as harvest skid trail specifications.

As well, each state's BMP manual addresses soil compaction, rutting, and general site degradation by providing measures to utilize when performing forest operations with heavy equipment during periods of wet weather or during times of the year when water may be ponded on the site.

These BMPs reflect best practices, developed, and refined over time, and regional review by the Southern Group of State Foresters annually and compiled as guidance for state agencies (Southern Group of State Foresters, Water Committee, 2007).

The BMP programs in these states are widely used and report rates of compliance between 88-98%. The most recent report from the National Association of State Foresters (NASF) published in 2019 shows the following implementation rates for the three states included in the RBA region: Florida 99.81%, Georgia 94.37%, South Carolina 88.93%. These compliance rates reflect the frequency that state BMPs are implemented appropriately when and where appropriate. Each state forestry agency conducts random samples of tracts experiencing timber harvesting activities across all ownership classes on a two-year cycle. BMP monitoring evaluates implementation of each applicable BMP and scores implementation across a range of BMP categories as well as overall BMP implementation for each tract. For example, the 2019 NASF report on BMP implementation shows that in the state of Florida, BMPs relating to roads were correctly implemented on 99.8% of properties sampled. BMPs relating to streamside management zones were appropriately implemented on 98.9% of properties sampled in Florida. Similar results are available for 8 – 12 BMP categories depending on the state.   Further, effectiveness of BMPs is well documented and widely accepted nationally and in the US South. In their literature review and synthesis of the effectiveness of forestry BMPs in the US, Cristan et al noted numerous studies in the South demonstrating the effectiveness of BMPs in protecting water quality. A total of 30 studies were reviewed. Examples of studies referenced, and their conclusions include:
- Ruhlman (1999) found that forestry BMPs in the upper coastal plain of GA were effective in protecting water quality
- Williams et al (1999) found that BMPs for site preparation and timber harvesting in SC were effective in reducing suspended sediments in streams
- Vowell (2001) and Vowell and Fryburg (2004) found that "correctly implemented BMPs applied to areas around streams provide protection to stream ecosystems during intensive silviculture activities including chemical applications".

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just

under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

As noted under Indicator 8.1.1, 86.7% stakeholder who expressed an interest in one or more of the three states located within the RBA region (FL, GA, SC) either agreed or strongly agreed that soil quality is maintained and, if necessary, improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes on family forest lands. These results strongly indicate confidence among stakeholders that family forest owners are applying appropriate control systems for soil quality and watershed protection.

Moreover, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

Based on the inclusion in state BMPs of measures to minimize the noted impacts from a wide range of forestry operations, widespread use of BMPs, their demonstrated effectiveness, requirements for BMP use by biomass suppliers and information about landowner attitudes toward water, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

CRITERION 8.2 **The water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) shall be at least maintained and where necessary improved.**

INDICATOR 8.2.1 Forest operations within the FMU should not negatively impact the local hydrology of natural water courses, water bodies, riparian zones, and their connections.

INDICATOR 8.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Indicator 8.2.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as

a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature, stakeholder engagement. Refer to BMP Overview section.   We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

There are many factors that impact water quality including point and non-point sources. Non-point sources are exempt from Clean Water Act permitting requirements and are therefore not regulated or monitored. Forestry is considered a non-point source, along with urban and agricultural settings. Land use affects ground- and surface-water quality. According to a 1996 report by the USGS (Berndt et al) of a study in the Georgia-Florida Coastal Plain, most effects are seen in urban and agricultural areas, even though forests represent a significantly larger portion of the landscape (48% in forests as opposed to 28% in agriculture). Because normal forestry operations are not formally regulated under the CWA, monitoring of forestry BMPs is an important proxy for maintaining water quality in forested areas. Forestry BMPs are designed to protect local hydrology of natural water courses, water bodies on site and downstream, riparian zones and their connections. Forestry operations are guided by BMPs.

The BMPs in the three states in the RBA region specifically include practices to protect riparian zones including the establishment of streamside management zones (SMZs), retention of bank trees and residual basal area and vegetative ground cover, depending on the order of stream.

To protect natural water courses and water bodies both on site and downstream, each of the state's BMPs identify stream and/or other water body types as perennial, intermittent, and ephemeral. Detailed BMPs such as SMZs, residual basal area, stream crossings, road construction, heavy equipment operation are specified within the manuals for each type of water body.

Best management practices (BMPs), as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on soils and water features. These programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA.

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

Effectiveness of BMPs is well documented and widely accepted nationally and in the US South. The proper use of forestry BMP's have been reported to improve water quality 80-90% above prior practices. (Walbridge, 1993). It is also worth noting that the Dutch Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) concludes that criterion 8.2 is largely addressed by compliance with law via ATFS, and the score is "covered otherwise". Internal records maintained by ATFS indicate that roughly 14% of family forest owners within the RBA region are actively enrolled in ATFS certification.

In response to AFF's May 2020 stakeholder questionnaire, 85.3% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) is maintained and where necessary improved on family forest lands. The remaining responses had no opinion on this issue. No stakeholders expressed disagreement. These results indicate strong support for measures taken to protect natural water courses, water bodies and riparian zones on family forest lands. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Additionally, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

Lastly, as mentioned in the BMP Overview Section of the RBA, the Federal Clean Water Act and corresponding state laws such as the Georgia Water Quality Control Act and the South Carolina Pollution Control Act explicitly prohibit degradation of waterways and wetlands, including provisions for significant civil and criminal penalties.

On the basis that forestry operations are governed by BMPs that include provisions to protect local hydrology and water courses, these BMPs are widely used and have been determined to be effective, in additional to the disposition of family landowners to protect water features, we conclude risk of noncompliance with this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:
1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.2.2 All forestry operations within the FMU with a potential negative environmental impact shall be accompanied by appropriate control systems and procedures with regard to protection of water resources both within and downstream from the FMU, based on national and regional best practices.

INDICATOR 8.2.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Indicator 8.2.2 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature; stakeholder engagement. Refer to BMP Overview Section. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

As outlined in the RBA's overview section on BMPs as well as in response to other criteria, forestry BMPs are designed as mitigation measures to be implemented in tandem with forest management or, by themselves, as forest management practices designed to minimize potential negative impacts from forestry operations on water resources both onsite and downstream.

The BMPs in these states specifically include practices to protect riparian zones including the establishment of streamside management zones (SMZs), retention of bank trees and residual basal area and vegetative ground cover, depending on the order of stream.

To protect natural water courses and water bodies both on site and downstream, each of the state's BMPs identify stream and/or other water body types by perennial, intermittent, and ephemeral. Detailed BMPs such as SMZs, residual basal area, stream crossings, road construction, heavy equipment operation are specified within the manuals for each type of water body.

These BMPs reflect best practices, developed, and refined over time, and regional review by the Southern Group of State Foresters annually and compiled as guidance for state agencies (Southern Group of State Foresters, Water Committee, 2007). These BMP programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA.

Effectiveness of BMPs is well documented and widely accepted nationally and in the US South. The proper use of forestry BMP's have been reported to improve water quality 80-90% above prior practices. (Walbridge, 1993).

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

As noted under Indicator 8.2.1, a majority of stakeholders (85.3%) responding to AFF's May 2020 questionnaire indicate support for measures taken to protect natural water courses, water bodies and riparian zones on family forest lands.

Additionally, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

On the basis that forestry operations in these states are governed by BMPs that include provisions to protect onsite and downstream water bodies, that these BMPs are widely used and have been determined to be effective, in additional to the proclivity of family landowners to protect water features, we conclude risk of noncompliance with this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

CRITERION 8.3 Important ecological cycles present in the FMU are preserved, including carbon and nutrient cycles.

INDICATOR 8.3.1 Site preparation and harvesting methods have been designed to minimize soil compaction and maximize the retention of nutrients on-site.

INDICATOR 8.3.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 8.3 as written applies specifically to the FMU level, this Criterion and associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature; stakeholder engagement. Refer to BMP Overview Section. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

Retaining soil on the forested landscape is important to both forest productivity and pollution control, including the retention of nutrients in the site. Sediment is considered one of the most substantial water pollutants associated with forestry activities. (Yoho, 1980)

Best management practices (BMPs), as outlined in the RBA's overview section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on soils and water features. These programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA.

Each of the states in the scope of this RBA include measures for site preparation and harvesting practices that minimize soil disturbance and compaction and reduce deposition and promote retention of sediment and nutrients onsite. These measures include SMZs, stream crossings, road construction, skid trails, and others.

Effectiveness of BMPs is well documented and widely accepted nationally and in the US South. The proper use of forestry BMP's have been reported to improve water quality 80-90% above prior practices as well as reducing deposition of sediment, nutrients, and organic matter. (Walbridge, 1993) Sediment (nutrient) loss following harvest and site preparation was 80% less in the recent study than in the original study. (NCASI, 2012)

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of

threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

In response to AFF's May 2020 stakeholder questionnaire, 73.5% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that important ecological cycles are preserved, including carbon and nutrient cycles. Only 4.4% disagreed or strongly disagreed and the remainder were neutral or had no opinion. These results indicate significant support among interested stakeholders for measures taken to minimize soil compaction and avoid the loss of soil nutrients on family forest lands. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Moreover, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

Based on the inclusion in state BMPs of measures to minimize impacts to soils and present sediment deposition, widespread use of BMPs, their demonstrated effectiveness, requirements for BMP use by biomass suppliers and information about landowner attitudes toward water, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:
- We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.3.2 There is evidence that specific measures have been taken to ensure that sensitive areas are sufficiently protected from erosion or fire.

INDICATOR 8.3.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Criterion 8.3 as written applies specifically to the FMU level, this Criterion and associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment including review of relevant literature; stakeholder engagement. Refer to BMP Overview section.

EVALUATION OF COMPLIANCE:

As outlined in the BMP overview section of this RBA, forestry BMPs are designed to minimize the impacts of forest management and protect important and sensitive features during operations. BMPs in the states covered by this RBA specifically address protection of sensitive areas from fire and erosion.

The BMPs in these states specifically include practices to protect sensitive areas from erosion. Georgia's BMP manual outlines practices for these areas in pages 11-29, while Florida's BMP manual denotes practices for these areas in pages 12-17. The South Carolina BMP manual covers specific BMPs for trout waters on pages 12-13.

To protect sensitive areas from fire, each of the state's BMPs include measures to address such practices. In Georgia, silvicultural practices avoid high intensity fire in ephemeral areas (pp 21) and streamside management zones adjacent to bodies of water and intermittent streams (pp 49). Florida's BMP manual outlines BMPs for fire line installation and prescribed burning within SMZs (pp 32-33). The BMP manual in South Carolina prescribes BMPs to be utilized as well as practices to avoid when conducting prescribed burning (pp 44-45).

As outlined elsewhere in this RBA, BMPs programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA. Similarly, effectiveness of BMPs is well documented and widely accepted nationally and in the US South. The proper use of forestry BMP's have been reported to improve water quality 80-90% above prior practices. (Walbridge, 1993).

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

Additionally, NWOS results for this region suggest that 88% of family landowners report "nature protection" as a very to moderately important reason for owning land (Table 7). This suggests that landowners are likely act to protect sensitive areas if present on their properties.

Based on the inclusion in state BMPs of measures to minimize impacts from erosion and fire, widespread use of BMPs, their demonstrated effectiveness, requirements for BMP use by biomass suppliers and information about landowner attitudes toward nature protection, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

CRITERION 8.4 Unnecessary damage to ecosystems is prevented by applying Reduced Impact Logging and the most suitable road construction methods and techniques for local conditions.

INDICATOR 8.4.1 There is evidence that the most suitable logging (Reduced Impact Logging (RIL)) and road construction methods and techniques are used in the FMU to prevent unnecessary damage to ecosystems. This may include the use of RIL techniques, adapted to the site-specific characteristics within the FMU.

INDICATOR 8.4.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Indicator 8.4.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the implementation of Best Management Practices is tracked regularly by state agencies and found a high rate of compliance across the RBA region, these data serve as a reasonable proxy and strongly indicate that measures are taken to protect soil health and productivity on Category 2 lands. We conducted a qualitative assessment review of relevant literature showing effective harvesting and road construction methods for preventing unnecessary damage to ecosystems with proper BMP use; discussion of logger training efforts in region. Refer to BMP Overview section. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

Best management practices (BMPs), as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on ecosystems. BMPs for each of the states included in this RBA include specific provisions for logging techniques and road construction and maintenance.

Each of the states in the scope of this RBA include measures for harvesting and road construction methodology that can be tailored to individual site conditions. These methods followed properly have been proven to avoid damage to ecosystems.

BMPs specify logging techniques to minimize impacts for a range of circumstances. For example, Georgia BMPs include provisions for minimizing equipment traffic in and around ephemeral areas, precautions for minimizing soil disturbance and litter layer in these areas and that protection structures should not interfere with the natural flow of water (Georgia BMPs for Forestry Manual, pp 21). In Florida BMPs for timber harvesting provide guidelines for location, construction and maintenance of roads and skid trails, in relation to contours, SMZs and loading decks as well as the proper disposal of logging slash to prevent erosion and prevent damage to ecosystems (Florida Silviculture BMP Manual, pp 31). South Carolina's BMP manual outlines a range of timber harvesting BMPs to reduce the impact of logging on ecosystems (South Carolina Forestry BMP Manual, pp 30-37)

BMP programs that incorporate all these practices to prevent unnecessary damage to ecosystems are widely used. Compliance between 88-98% in the states included in scope of this RBA are reported.

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

In response to AFF's May 2020 stakeholder questionnaire, 92.6% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that unnecessary damage to ecosystems is prevented by applying BMPs and the most suitable road construction methods and techniques for local conditions. Only 1.5% disagreed or strongly disagreed and the remainder were neutral or had no opinion. These results indicate significant support among interested stakeholders for utilization of appropriate logging and road building techniques to prevent unnecessary damage to ecosystems on family forest lands. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Moreover, NWOS results for this region suggest that 84% of family landowners report "water protection" as a very to moderately important reason for owning land (Table 7). Similarly, AFF's 2016 survey of landowners in this region found that 83% of respondents report that "protecting water resources" is a reason they own their land. This suggests that landowners are likely act to protect water resources or features if present on their properties.

Based on the inclusion in state BMPs of measures to minimize impacts from harvesting and road construction, widespread use of BMPs, their demonstrated effectiveness, requirements for BMP use by biomass suppliers and information about landowner attitudes toward water, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:
1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.4.2 Harvest planning and harvest operations are carried out in accordance with national or sub-national (e.g., State) best practice guidelines.

INDICATOR 8.4.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Qualitative assessment including review of relevant literature; stakeholder engagement. Refer to BMP Overview section.

EVALUATION OF COMPLIANCE:

As outlined in the RBA's section on BMPs as well as in response to other criteria, forestry BMPs are designed as mitigation measures to be implemented in tandem with forest management or, by themselves, as forest management practices designed to minimize potential negative impacts from forestry operations.

The BMPs in these states specifically include practices for harvest planning and operations. BMPs specify harvest techniques to minimize impacts for a range of circumstances. To allow for proper planning of harvest activities, the BMP manual in Georgia devotes a section to planning for water quality (pp 6-24), while South Carolina's BMP manual denotes planning and execution BMPs for timber harvests (pp 30-37). Florida's BMP manual contains extensive appendices with tables and charts for planning harvest operations (pp 57-107). For harvest operations, Georgia BMPs include provisions for minimizing equipment traffic in and around ephemeral areas, precautions for minimizing soil disturbance and litter layer in these areas and that protection structures should not interfere with the natural flow of water (pp 21). In Florida BMP for timber harvesting discuss location, in relation to contours, SMZs and loading decks as well as the proper disposal of logging slash to prevent erosion and prevent damage to ecosystems (pp 31). South Carolina's BMP manual outlines and discusses a range of timber harvesting BMPs to reduce the impact of logging on ecosystems (pp 30-37). These harvest planning and operation provisions reflect best practices, developed and refined over time, and regional review by the Southern Group of State Foresters annually and compiled as guidance for state agencies (Southern Group of State Foresters, Water Committee, 2007).

BMP programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA.

All three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants.

Effectiveness of BMPs is well documented and widely accepted nationally and in the US South.

On the basis that harvest and forestry operations in these states are governed by state forestry BMPs that specify practices for harvest and operations, the BMPs are widely used and have been determined to be effective, we conclude risk of noncompliance with this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

CRITERION 8.5 **If fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken.**

INDICATOR 8.5.1 Where fires are used to achieve forest management objectives, such as regeneration of specific tree species, adequate control systems and procedures shall be in place, including fire control and safety precautions.

INDICATOR 8.5.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Qualitative analysis of BMPs combined with the laws governing prescribed fire in each of the three state with an overview of the fire protection laws, methodology, and monitoring in each of the states. Refer to the BMP Overview Overview for BMP Use and Monitoring within the RBA. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

EVALUATION OF COMPLIANCE:

Best management practices (BMPs), as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities.

Each state within the RBA geography has BMPs specifically addressing prescribed burning and/or fire lines or firebreaks. These include specific protocols and procedures for ensuring safety and fire containment such as the location and installation of fire breaks, burning in SMZs, monitoring of fuel moisture to inform timing of activities and minimize potential impacts to mineral soil, etc. (Georgia BMP manual pp 49, Florida BMP manual pp 32-33, South Carolina BMP manual pp 44-45)

The state forestry agencies in Florida, Georgia, and South Carolina are legally designated as responsible for forest protection on all lands in their respective states. These agencies are organized with personnel and equipment to respond to wildfires within each county of their state.

Additionally, each state has laws and regulations on the use of prescribed fire. Laws in each state require permitting of silvicultural burning by the state forestry agency, tasks these agencies with prescribed fire training for professionals and the public and gives them a role in educating the public on prescribed burning and wildfire. Each of the state forestry agencies has a legal mandate to enforce these and other forestry laws.

As outlined elsewhere in this RBA, BMP programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA. Similarly, effectiveness of BMPs is well documented and widely accepted nationally and in the US South.

Additionally, in response to AFF's May 2020 stakeholder questionnaire, 86.8% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that if fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken. Only 1.5% disagreed or strongly disagreed and the remainder were neutral or had no opinion. These results indicate strong support among interested stakeholders for control measures used with prescribed fire on family forest lands. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Based on the inclusion in state BMPs of practices and protocols for use of fire, widespread use of BMPs, their demonstrated effectiveness and requirements for BMP use by biomass suppliers, we conclude risk for this indicator is low.

DISCLAIMERS AND CONSIDERATIONS:
None

CRITERION 8.6 **The forest management measures are designed to prevent and control diseases and pests where these form a threat to natural capital.**

INDICATOR 8.6.1 The forest manager has identified pests and diseases that are present and that potentially threaten the natural stock within the FMU.

INDICATOR 8.6.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Indicator 8.6.1 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because the framework for detection, prevention and control is implemented largely by federal and state agencies on behalf of private forest landowners, the operation of this network demonstrates that measures are taken to protect soil health and productivity on Category 2 lands throughout the RBA region. We research the functionality of state and federal resources utilized as a network for early detection and rapid response to disease and pest outbreaks within the RBA geography. We also consult

survey results from the NWOS which indicate that FFO's are concerned about disease and pests and know their property well enough to detect infestations.

ASSESSMENT OF COMPLIANCE:

The National Woodland Owner Survey (NWOS) of family forest owners measured concerns and conservation values of these landowners in the southeastern United States, including the states of Georgia, Florida, and South Carolina. Of the approximately 574,000 family forest landowners with 10 or more acres, 84% were moderately to greatly concerned about insect and disease infestations of their forest. Moreover, the survey indicates family forest owners in this region have a strong emotional tie to their land (68%) and they know their forest very well (79%). Given these results, it is safe to extrapolate that family forest owners in this region are protective of their land and observant of threats from insects and disease to their forests.

The federal government and state governments of Georgia, Florida, and South Carolina operate within a well-developed network to prevent, detect, evaluate, and suppress forest insect and disease pest problems on both public and private ownerships. At the federal level, the United States Forest Service's (USFS) Forest & Grassland Health Section is a partner to the states for this work. Offices and staff are stationed in Atlanta, Georgia and Ashville, North Carolina to offer technical support, research, and laboratory facilities to support these efforts and work in partnership with state forestry agencies in the southeast including the Georgia Forestry Commission, Florida Forest Service, and South Carolina Forestry Commission. Each of these agencies have forest health staff, partially funded by USFS grants, to provide prevention, detection, evaluation, and suppression oversight within the state. As well, each of the state forestry agencies have forestry professionals assigned to each county within the state, who have been trained in the prevention, detection, evaluation, and suppression of a wide range of insects and disease that may occur on forest land within their county and work directly with family forest owners on a range of issues including insect and disease pest problems.

Another federal partner in this effort is the Animal and Plant Health Inspection Service (APHIS). They work alongside other federal and state partners to identify pests that may be introduced into the United States though inspections at points of entry. The last reporting from APHIS states the agency and partners, 'Intercepted 79,388 pests found during U.S. Customs and Border Protection inspections of 30,227 ships and more than 1.2 million cargo, mail, and express carrier shipments and took quick action to prevent those of concern from entering the United States'. If a pest or disease of concern is detected, APHIS implements emergency protocols and partners with affected States. The current forest related insects and diseases that APHIS works with the states to help identify, manage, and control include Asian Longhorn Beetle, Emerald Ash Borer, Asian Gypsy Moth, Pine Shoot Beetle, Spotted Lanternfly, Sudden Oak Death, and Thousand Cankers Disease.

In addition to family forest owners identifying potential insect and disease pest problems, each state agency forest health staff develops detection methodology for a list of native and invasive insects and diseases that have the potential to pose a high threat level to private and public forests in their state. Some of this methodology may be developed at a regional scale with the assistance of the USFS Forest Health Section. This methodology includes aerial and ground surveys, ground trapping, submittal, and testing of samples by the public, early detection rapid response trapping, damage assessments and evaluations, and other means.

According to state and federal reporting and websites, there are certain insect and diseases common to the three states of Georgia, Florida, and South Carolina that present and/or potentially cause significant damage to natural stands of forests. These include Southern Pine Beetle, Ips Engraver Beetles, Red Ambrosia Beetle causing Laurel Wilt Disease, and Herterobasidion Root Disease (formerly Annosus root disease). Additionally, Georgia and South Carolina have identified the following pests which threaten to cause significant damage Emerald Ash Borer, Asian Gypsy Moth, Hemlock Wooly Adelgid, and Thousand Cankers Disease. Individually South Carolina has identified Beech Scale (insect), Oak Wilt Disease, and Beech Bark Disease as pests that threaten forest in their state. Georgia has identified Sudden Oak Death as a pest that threatens forest in their state.

Once an insect or disease pest is identified, the affected forest owners are notified and advised of any control measures to be taken. Each state develops a report of the insect and disease pests identified within their states and the USFS Forest Health Section develops a national report identifying these insect and disease pests spatially by county and state.

Given family forest owners are concerned about insect and disease and observant of changes in their forest combined with the extensive framework of federal and state detection and reporting of identified pests with the RBA geography, we assess the associated risk to be low.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 8.6.2
INDICATOR 8.6.2 Where applicable, the forest manager has procedures in place to prevent and control potential and existing pests and diseases that have been identified (e.g., by applying Integrated Pest Management (IPM)).

INDICATOR 8.6.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Consult the NWOS regarding landowner attitudes toward insect and disease control, expert consultation on common practices within the RBA. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region. Research legal authority and responsibility of federal and state agencies in Integrated Pest Management (IPM) techniques for both native and non-native pests. These include inspection, surveillance, outreach and education, quarantine, and control measures.

EVALUATION OF COMPLIANCE:
The National Woodland Owner Survey (NWOS) of family forest owners measured concerns and conservation values of these landowners in the southeastern United States, including the states of Georgia, Florida, and South Carolina. Of the approximately 574,000 family forest landowners with 10 or more acres, 84% were moderately to greatly concerned about insect and disease infestations of their forest. Moreover, the survey indicates family

forest owners in this region have a strong emotional tie to their land (68%) and they know their forest very well (79%). Given these results, it is safe to extrapolate that family forest owners in this region are protective of their land and observant of threats from insects and disease to their forests. In discussions with experts, it is common practice within the geography of -the RBA for landowners to follow through with pests control measures when a pest threat is identified on their property.

Additionally, in response to AFF's May 2020 stakeholder questionnaire, 83.8% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that management on family forests is designed to prevent and control diseases and pests. Only 4.4% disagreed or strongly disagreed and the remainder were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

As previously mentioned, prevention and control of identified pests is a partnership of landowners, state, and federal governments in the United States. The hierarchy and responsibility of the prevention and control effort is dependent of whether the pest is native to the United States or non-native (imported from another area outside of the US). Both federal and state legislation determines this hierarchy.

Within this partnership network, the US Department of Agriculture Animal and Plant Health Inspection Service is given broad authority under the Plant Protection Act of 2000 (Agricultural Risk Protection Act of 2000, Title IV) to "inspect, seize, quarantine, treat, destroy, or dispose of imported plant and animal materials that are potentially harmful to U.S. agriculture, horticulture, forestry, and, to a certain degree, natural resources." When a non-native pest is identified as being a threat to forests, APHIS launches, with state and other federal partners, an IPM approach of surveillance, detection, outreach and education, quarantine, and treatments to combat the threat.

The states of Florida, South Carolina, and Georgia have state laws allowing cooperation with the federal government on prevention and control of non-native pests, but also to prevent and control native and non-native pest outbreaks within their borders.

Florida's laws give the Florida Department of Agriculture and Consumer Services (FDACS) the ability "to investigate methods of control, eradication, and prevention of dissemination of plant pests, noxious weeds, or arthropods. To supervise, or cause to be supervised, the treatment, cutting, and destruction of plants, plant parts, fruit, soil, containers, equipment, and other articles capable of harboring plant pests, noxious weeds, or arthropods, if they are infested or located in an area which may be suspected of being infested or infected due to its proximity to a known infestation, or if they were reasonably exposed to infestation, to prevent or control the dissemination of or to eradicate plant pests, noxious weeds, or arthropods." (2019 Florida Statutes, Chapter 581). FDACS carries out this responsibility through two divisions within the department, the Florida Forest Service and Plant Industry.

According to South Carolina law, the South Carolina Forestry Commission (SCFC) has "the authority and responsibility for action programs to detect and control forest pest outbreaks' while the State Crop Pest Commission (SCPC) shall be responsible for "the establishment of quarantine regulations and other actions to prevent the introduction into or the spread of introduced forest pests". Whenever a pest outbreak is suspected, the SCFC will make surveys to detect the outbreak extent, consulting with SCPC. If control measures are necessary, the SCFC will accomplish the following steps:

1. Designate a control zone with clearly established boundaries
2. Give notice to all affected forest landowners within the control zone of the existence of the control zone and the actions to be taken
3. Be responsible for surveys in conjunction with the determined action programs to evaluate control

If a forest pest outbreak cannot be or is not being controlled by the forest landowners, the SCFC has the authority to:
1. Take necessary measures to control the forest pest.
2. Procure necessary equipment, supplies and services to control, suppress, or eradicate the forest pest.
3. Enter into agreements with the United States Forest Service or other federal or State agencies, corporations, and others to carry out the control
4. Enter any property to investigate or control the pests
5. Apply for a court injunction or other appropriate means to restrain any person from interfering with their control activities

(SC Code of Laws, Title 48, Chapter 29)

Laws in the State of Georgia give the Georgia Forestry Commission (GFC) authority to:
1. Enter any land on which GFC believes there is a pest infestation or infection to determine the cause and extent
2. Notify the landowner of the pest outbreak and recommend actions to be taken by the landowner to prevent the spread
3. If the landowner fails to act in a reasonable time following the notification, the GFC may take the following actions:
4. Fell and remove infested or diseased trees
5. Fell and chemically treat infested or diseased trees
6. Chemically treat standing infested or diseased trees
7. Take other effective control methods

(Georgia Forestry Laws, pp 17)

Given the legal framework at the federal and state level, the partnership network that exists from the federal level through the county level, within the state forestry agencies to detect and control pest outbreaks combined with the common practice of forest landowners within the RBA geography to control pest outbreaks on their property, we assess the risk to be low.

DISCLAIMERS AND CONSIDERATIONS:
None

CRITERION 8.7 The use of chemicals is only permitted if ecological processes and the optimal deployment of sustainable alternatives prove insufficient. Pesticides classified as Type 1A and 1B by the World Health Organisation (WHO) and chlorinated hydrocarbons are not permitted.

INDICATOR 8.7.1 The forest manager shall not use or store any of the WHO Type 1A and 1B pesticides and chlorinated hydrocarbons.

INDICATOR 8.7.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Indicator 8.7.1 as written applies specifically to the FME level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because there exists a robust framework of federal and state laws governing registration and use of pesticides does not include any WHO Type 1 or Type 2 pesticides for forestry use, these regulations apply equally to all Category 2 lands throughout the RBA region. We researched general use of chemicals for forestry within the RBA region; chemical usage based on ecological process and lack of sustainable alternative options. We researched the use of any World Health Organization (WHO) Type 1A and 1B and any chlorinated hydrocarbon pesticides in forestry applications. We reviewed state laws that may prohibit use of certain pesticides. BMPs in each state also address pesticide use in forestry operations. Refer to BMP overview section of the RBA report. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

ASSESSMENT OF COMPLIANCE:

As discussed in the Nature of Category 2 Lands overview section of the RBA report, as well as under Criterion 3.3, the vast majority of these landowner within the scope of the RBA, do not intensively manage their forest land. Chemical usage is associated with intensive forest management regimes, so chemical use would be limited on family forest land within the scope of the RBA.

In response to AFF's May 2020 stakeholder questionnaire, only 2.2% of stakeholders expressing an interest in one of three states in the RBA region disagreed or strongly disagreed that pesticides classified as type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted. Conversely, 33.7% agreed or strongly agreed that these pesticides are not allowed. In contrast to other responses to the stakeholder questionnaire, a majority of stakeholders (64%) were neutral or had no opinion (40.4%) or did not provide a response for this issue (23.6%). When we look only at those respondents who expressed an opinion on this issue, 93.8% (30 of 32 respondents) agree these pesticides are not allowed. We have drawn two conclusions from these results. First, the majority of respondents are not familiar with highly toxic pesticides. Secondly, the results strongly indicate that these pesticides are not used on family forest lands in the RBA region. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

The Environmental Protection Agency (EPA) uses its own classification system to label hazardous pesticides in the United States, which is a different classification system than the Globally Harmonized System (GHS) that uses the classification of the WHO. We analysed and compared all of the WHO type 1A and 1B chemicals with the EPA's Office of Pesticide Programs' Pesticide Chemical Registry under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Of the 89 chemicals on the WHO list, only four are currently registered in the US: Chlorophacinone [ISO], Diphacinone [ISO], 3-Chloro-1,2-propanediol [C], and Warfarin (ISO). These chemicals are only used as rodenticides or to sterilize rodents; none of these four chemicals are approved, or would be especially useful, in forestry. Chlorinated hydrocarbons are generally phased out of use in the US except in extreme emergencies with no other viable alternatives. None are registered with EPA for forestry uses.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is the United States law that provides for federal regulation of pesticide distribution, sale, and use. All pesticides distributed or sold in the United States must be registered (licensed) by EPA. The three basic requirements that apply to forest management are that: 1) people can only sell and apply pesticides that have been approved by the federal government; 2) people can only use a pesticide in a manner consistent with the instructions on its label; and 3) people cannot obtain or apply especially dangerous pesticides unless they are licensed applicators. States can enact their own pesticide laws if they do not interfere with the regulatory scheme of FIFRA (FSC US CW NRA, pp 46-47).

Additionally, the Dutch Advisory Commission Sustainability Biomass for Energy Applications (ADBE) concluded in their public assessment report for ATFS that the portion of Criterion 8.7 relating to the use of WHO Type 1 & Type 2 pesticides was adequately addressed by the fact that only four are registered with the EPA and none are approved for forestry applications.

Given that family forest owners within the scope of the RBA are unlikely to use chemicals and, if so, none of the WHO Type 1A or 1B pesticides or chlorinated hydrocarbons have forestry uses, we assess this protocol to be low risk.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 8.7.2 Where chemicals are used, an up-to-date list is kept of all pesticides used in the FMU.

INDICATOR 8.7.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Indicator 8.7.2 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because there exists a robust framework of federal and state laws governing registration and use of pesticides, our assessment of conformance is focused on the universal application and enforcement of those laws under the premise that they apply equally to all Category 2 lands throughout the RBA region. We conducted a Qualitative analysis based on the laws and regulations of the states

within the RBA. We researched legal requirements and common practice regarding pesticide inventory, training, handling, application, storage, and emergency procedures. We evaluated BMPs for forestry operations in each state within the RBA to the extent that they address pesticide use. Refer to BMP Overview section. We considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region. We also consulted experts familiar with pesticide use on family forest lands within the RBA region.

ASSESSMENT OF COMPLIANCE:

All pesticides distributed or sold in the United States must be registered (licensed) by EPA. The EPA also maintains a list of restricted use pesticides (RUPs).

As noted above under Indicator 8.7.1, the application of chemicals tends to be limited on family forest land within the scope of the RBA. In most cases where chemical use is necessary on family forest land, the application is done by a commercially licensed applicator. Any applicator, family forest owner or commercial applicator, is bound by the legal obligation of following pesticide labels. Each label contains information on product ingredients, toxicity level, safety statements, first aid information, environmental hazards, personal protective equipment, directions for use, storage and disposal, manufacturer's contact information, phone number for more information, and EPA registration number.

Where EPA has delegated authority for certification of pesticide applicators to a state, it is usually a state agriculture agency that oversees certification. State cooperative extension services may also play a role in training and testing applicators. All the states within the scope of this RBA have extensive pesticide laws and regulations concerning the distribution, sale, and use of pesticides. In the states of Florida and Georgia the Department of Agriculture is given this authority, while in South Carolina the authority is given to the Department of Pesticide Regulation, a part of Clemson University. Any individual or company applying pesticides as a commercial service must have a state issued license. Additionally, any application of a RUP requires a license.

The state laws and regulations relating to licensed pesticide applicators include requirements for record keeping and retention (2 years is typical). For example, the Georgia Pesticide Control Act states, 'Any person issued a license, permit, or registration under this article may be required by the Commissioner to keep accurate records containing the following information: 1) The delivery, movement, or holding of any pesticide or device, including the quantity thereof; 2) The date of shipment and receipt; 3) The name of consignor and consignee; and, 4) Any other information necessary for the enforcement of this article, as prescribed by the Commissioner. (b) The Commissioner shall have access to the records required in subsection (a) of this Code section at any reasonable time…' (Georgia Pesticide Control Act pp 15).

Results from the AFF stakeholder questionnaire distributed in May 2020 sought stakeholder perspectives on whether the use of chemicals is only permitted if alternatives prove insufficient. These results, which are applicable to 89 respondents, were mixed and did not provide a clear majority opinion. While 30.3% of respondents agreed chemical use is only permitted when other alternatives are insufficient, 29.2% did not agree. A relative majority of 40.4% were either neutral, had no opinion or chose not to provide a response. Similar response ratios were provided by the full population of respondents. When we looked only at practitioners and regulators (landowners, consulting foresters, natural resource professionals and public agency personnel) the result changed only slightly with 33.8% in agreement and 29.2% in disagreement. We suspect respondents may

be responding to the literal wording in the questionnaire that suggests the use of otherwise approved chemicals is only legally permitted if all other alternatives are proven to be insufficient. Even so, we were led to consult with regional experts to get a better sense of how and when chemicals are applied on family forest lands.

Pesticides are typically applied on family forest lands in association with regeneration activities, specifically planting pine trees. Herbicides are frequently applied once or twice in the life of a planted stand: first as a site preparation tool, and then, less frequently for weed control within five years of planting. According to experts consulted, site preparation activities are typically conducted by licensed professions. Depending on the size of the area treated (e.g., < 50 acres), herbicide applications for weed control can be more frequently conducted by landowners who may or may not have a pesticide applicators license. Landowners are strongly incentivized to maintain records and to exercise caution in applying herbicides given the legal requirements and risk to property and health/safety that can result from improper usage. As evidence, experts point to the frequency with which state and county specialists are consulted for guidance and information on the correct application of chemicals. State agencies also provide easily accessible resources for landowners on the proper application of pesticides, including selection of proper herbicides for target weeds, mixing instructions, calibration of equipment, timing, safety, and application techniques. Landowners are also required to keep records of herbicide applications associated with Federal cost-share programs.

Given the robust framework of laws and regulations surrounding chemical use and their enforcement at the state and federal level within the scope of the RBA, along with the less intensive management of forest by family forest owners and the propensity for family forest owners to engage licensed professionals (who are required to keep records of chemicals applied) for chemical applications, we assess the risk for these protocols as low.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 8.7.3 Where chemicals are used, all staff and contractors involved in their use have received training in handling, application, and storage procedures.

INDICATOR 8.7.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes, refer to the Assessment Methodology for Indicators 8.7.1 and 8.7.2.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
See Assessment Methodology for Indicators 8.7.1 and 8.7.2.

ASSESSMENT OF CONFORMANCE:
As stated above under Indicator 8.7.2, when pesticides are used on family forest lands, application is typically done by trained and licensed professionals. Florida's regulations state that all licensed applicators shall have a working knowledge of, 'Proper identification, storage, transport, handling, mixing and loading procedures and disposal methods for pesticides and empty pesticide containers, including management actions and precautions

to be taken to prevent children or other individuals from having access to pesticides or pesticide containers.' (FL Administrative Code 5E-9.023(g)).

South Carolina's Pesticide Control Act outlines the responsibilities of a licensed applicator regarding supervised workers stating, "Each licensed applicator shall provide to each unlicensed applicator or mixer-loader working under his or her direct supervision adequate instruction and training so that the applicator or mixer-loader understands the safety procedures required for the pesticides that will be used. The applicator or mixer-loader shall be given this training before handling restricted-use pesticides. This training shall be set forth by the department by rule and shall include, but not be limited to, the safety procedures to be followed as specified on the label; the safety clothing and equipment to be worn; the common symptoms of pesticide poisoning; the dangers of eating, drinking, or smoking while handling pesticides; and where to obtain emergency medical treatment. (South Carolina Pesticide Control Act 487.1585)

In the less common instance that unlicensed landowners apply pesticides on their own lands, they are likely to follow proper use guidance given the legal requirements and risk to property and health and safety that can result from improper usage. As evidence, experts point to the frequency with which state and county specialists are consulted for guidance and information on the correct application of chemicals. State agencies also provide easily accessible resources for landowners on the proper application of chemicals, including selection of proper herbicides for target weeds, mixing instructions, calibration of equipment, timing, safety, and application techniques.

Considering that pesticides are typically applied on Category 2 lands by and/or under the supervision of licensed professionals, that licensed professionals must complete initial and ongoing training to retain their licenses, and that landowners who apply pesticides without a license typically seek guidance from experts, the risk of non-compliance with Indicator 8.7.3 is low.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 8.7.4 Where chemicals are used, safe transport, storage, handling, application, and emergency procedures have been implemented.

INDICATOR 8.7.4 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes, refer to the Assessment Methodology for Indicators 8.7.1 and 8.7.2.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
See Assessment Methodology for Indicators 8.7.1 and 8.7.2.

ASSESSMENT OF CONFORMANCE:
As noted above under Indicator 8.7.1, any applicator, whether a family forest owner or commercial applicator, is bound by the legal obligation of following pesticide labels. Each label contains information on product

ingredients, toxicity level, safety statements, first aid information, environmental hazards, personal protective equipment, directions for use, storage and disposal, manufacturer's contact information, phone number for more information, and EPA registration number. Failure to comply with requirements on pesticide labels can result in civil and/or criminal penalties.

The FSC US CW NRA rates the United States as Low Risk for Environmental Regulations (Indicators 1.10 of the NRA) and Health and Safety (Indicator 1.11 of the NRA), stating 'Identified laws are upheld. Cases where law/ regulations are violated are efficiently followed up via preventive actions taken by the authorities and/or by the relevant entities.'

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society'. The United States has a Rule of Law percentile of 89.42 percent.

Each of the three states included in the RBA region maintain published BMP guidelines for forestry operations. All three BMP documents include sections on pesticide use that explicitly emphasize following pesticide label requirements, and address such topics as planning, storage, transport, handling, use and disposal of pesticides and containers. As noted in the BMP overview section of the RBA report, BMP implementation rates within the RBA region are very high: Florida and Georgia post overall implementation rates of 99.81% and 94.37% respectively, while South Carolina has an overall implementation rate of 88.93%.

The risk of non-conformance with Indicator 8.7.4 is deemed to be low for the following reasons:
• any applicator of pesticides in the US, whether or not they are licensed applicators, is legally obligated to follow label instructions at risk of civil or criminal penalty;
• according to the World Bank, the Rule of Law index for the US is high (89.42%);
• The FSC US CW NRA concluded low risk for Indicators relating to environmental regulations and health and safety; and,
• State BMPs address pesticide use and have high overall implementation rates throughout the RBA region.

DISCLAIMERS AND CONSIDERATIONS:
None

CRITERION 8.8 The accumulation of inorganic waste and litter is prevented, or such waste and litter is collected, stored in approved areas, and disposed of responsibly.

INDICATOR 8.8.1 There is a documented system in place for collecting and storing inorganic waste and litter safely, and for safe transportation for disposal.

INDICATOR 8.8.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Qualitative assessment including review of relevant literature showing BMP effectiveness and compliance with BMPs. Refer to BMP Overview section. We also researched applicable state laws.

ASSESSMENT OF COMPLIANCE:

Best management practices, as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for avoiding or minimizing potential impacts of forest management activities on ecosystems. BMPs for each of the states included in this RBA include guidelines for responsible disposal of waste in approved areas according to existing regulations, and BMP training is provided in all three of the state's professional logger training referenced in the BMP section.

In the Florida manual, BMPs referencing waste include: do not leave pesticide containers on site - these should be rinsed and disposed of according to the directions on the label (Florida Silviculture BMP manual, pp 34); proper collection and disposal of used oil is necessary to prevent soil and water contamination and to promote oil recycling (Florida Silviculture BMP manual, pp 35); do not dispose of solid wastes, such as trash, litter, containers, etc. into waterbodies of any kind (Florida Silviculture BMP manual, pp 35); remove trash, litter and other solid wastes from project areas. In particular, remove and properly dispose of all chemical containers, hydraulic fluid and oil containers, oil filters, batteries, and tires (Florida Silviculture BMP manual, pp 35).

Georgia's BMP manual makes references to waste: dispose of oils, lubrications, their containers and other wastes according to local, state and federal regulations (Georgia Forestry BMP Manual, pp 42); remove all used tires, batteries, oil cans, and trash from logging operations before leaving the site (Georgia Forestry BMP Manual, pp 42); clean up and/or contain fuel and oil spills immediately; comply with state and federal regulations when reporting spills; report any fuel, oil or chemical spills to the DNR EPD Hazardous Substance Office at 1-800-241-4113 (Georgia Forestry BMP Manual, pp 42). In the event of accidental oil spills, the spill must be contained, contaminated soils must be collected and delivered to an approved waste handling facility, and EPD must be notified (Georgia Forestry BMP Manual, pp 64). As well "pollutant" is defined as 'Natural or manmade waste material that contaminates air, soil or water' (Georgia Forestry BMP Manual, pp 76).

South Carolina's BMP manual references waste in the following areas: handle and store toxic and hazardous material such as fuels, lubricants, and solvents outside of the SMZ (SC Forestry BMP Manual, pp 8); dispose of oils, lubricants, their containers and other wastes according to local, state, and federal regulations (SC Forestry BMP Manual, pp 35); report any fuel, oil, or chemical spills to the Emergency Response Unit of the Department of Health and Environmental Control at 803- 53-6488 (SC Forestry BMP Manual, pp 35); avoid leaving (tree) planting bags or other garbage on the site (SC Forestry BMP Manual, pp 43); dispose of pesticide containers and/or excess pesticide according to state and federal regulations (SC Forestry BMP Manual, pp 47); clean up and/or contain all pesticide spills immediately and comply with state and federal regulations concerning re- porting spills of hazardous materials (pp 47); properly dispose of fertilizer containers (SC Forestry BMP Manual, pp 48).

BMP programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA. Effectiveness of BMPs is well documented and widely accepted nationally and in the US South. Additionally, each of the three states in the RBA region have laws and regulations governing the proper disposal of litter and waste. Furthermore, the public assessment report of the ATFS certification scheme completed by the Dutch Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) concludes that Criterion 8.8 is fully addressed by State BMPs.

Given that waste prevention and collection is included in each states BMP manuals and the compliance and effectiveness rate of BMPs is high, we assess the risk as low for this indicator.

DISCLAIMERS AND CONSIDERATIONS:
1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.8.2 There shall be no evidence that the FME's waste products are disposed of other than at the listed sites, and in accordance with environmentally appropriate and safe methods and applicable legal requirements.

INDICATOR 8.8.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes, refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Indicator 8.8.2 as written applies specifically to the FME level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. Because there exists a robust framework of state level BMPs addressing appropriate disposal of waste, our assessment focuses on these practice guidelines as they apply equally to all lands throughout the RBA region, including all Category 2 lands. We also researched applicable state laws. We conducted a qualitative assessment including review of relevant literature showing BMP effectiveness; compliance with BMPs, discussion of logger training efforts in region. Refer to BMP Overview section. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

ASSESSMENT OF CONFORMANCE:

Best management practices, as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on ecosystems. BMPs for each of the states included in this RBA refer to responsible disposal of waste in approved areas- according to existing regulations and BMP training is provided in all three of the state's professional logger training referenced in the BMP section.

In the Florida manual, BMPs referencing waste are: Do not leave pesticide containers on site - these should be rinsed and disposed of according to the directions on the label (Florida Silviculture BMP Manual, pp 34), Proper collection and disposal of used oil is necessary to prevent soil and water contamination and to promote oil recycling (Florida Silviculture BMP Manual, pp 35), do not dispose of solid wastes, such as trash, litter, containers, etc. into waterbodies of any kind (Florida Silviculture BMP Manual, pp 35), remove trash, litter and other solid wastes from project areas. In particular, remove and properly dispose of all chemical containers, hydraulic fluid and oil containers, oil filters, batteries, and tires (Florida Silviculture BMP Manual, pp 35)

Georgia's BMP manual makes references to waste: Dispose of oils, lubrications, their containers, and other wastes according to local, state, and federal regulations (Georgia Forestry BMP Manual, pp 42), Remove all used tires, batteries, oil cans, and trash from logging operations before leaving the site (Georgia Forestry BMP Manual, pp 42), Clean up and/or contain fuel and oil spills immediately. Comply with state and federal regulations when reporting spills. Report any fuel, oil, or chemical spills to the DNR EPD Hazardous Substance Office at 1-800-241-4113 (Georgia Forestry BMP Manual, pp 42), accidental oil spills, the spill be contained, contaminated soils be collected and delivered to approved waste handling facility, and EPD be notified (Georgia Forestry BMP Manual, pp 64). As well Pollutant is defined as 'Natural or manmade waste material that contaminates air, soil or water' (Georgia Forestry BMP Manual, pp 76).

South Carolina's BMP manual references waste in the following areas: Handle and store toxic and hazardous material such as fuels, lubricants, and solvents outside of the SMZ (SC Forestry BMP Manual, pp 8), Dispose of oils, lubricants, their containers and other wastes according to local, state, and federal regulations (SC Forestry BMP Manual, pp 35), Report any fuel, oil, or chemical spills to the Emergency Response Unit of the Department of Health and Environmental Control at 803- 53-6488 (SC Forestry BMP Manual, pp 35), avoid leaving (tree) planting bags or other garbage on the site (SC Forestry BMP Manual, pp 43), dispose of pesticide containers and/or excess pesticide according to state and federal regulations (SC Forestry BMP Manual, pp 47), clean up and/or contain all pesticide spills immediately and comply with state and federal regulations concerning re- porting spills of hazardous materials (SC Forestry BMP Manual, pp 47), properly dispose of fertilizer containers (SC Forestry BMP Manual, pp 48).

BMP programs are widely used and report rates of compliance between 88-98% in the states included in scope of this RBA. Effectiveness of BMPs is well documented and widely accepted nationally and in the US South. Additionally, each of the three states in the RBA region have laws and regulations governing the proper disposal of litter and waste. Furthermore, the public assessment report of the ATFS certification scheme completed by the Dutch Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) concludes that Criterion 8.8 is fully addressed by State BMPs.

Additionally, in response to AFF's May 2020 stakeholder questionnaire, 75.0% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that waste and litter are prevented, or collected, stored, and disposed of responsibly. Conversely, only 8.8% disagreed or strongly disagreed with the remaining 16.2% being neutral or expressing no opinion. These results indicate waste and litter is avoided on family forest lands, and responsibly handled and discarded when necessary. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Given the extremely high compliance rate of BMPs within the states included in the scope of this RBA, we assess the risk for this indicator as Low.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 8.8.3 All staff and contractors involved in the use of chemicals, fuel and oil have received training and materials for controlling and cleaning up chemicals, fuel, and oil in the case of accidental spillage.

INDICATOR 8.8.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Qualitative assessment including review of relevant literature showing BMP effectiveness; compliance with BMPs, discussion of logger training efforts with emphasis on safety in region. Reference to pesticide training in region. Refer to BMP Overview section.

ASSESSMENT OF COMPLIANCE:

Best management practices, as outlined in the RBA's section on BMPs, represent a rigorous, well developed and widely implemented system for addressing potential impacts of forest management activities on ecosystems. BMPs for each of the states included in this RBA refer to responsible disposal of waste, including chemicals, fuel, and oil in approved areas according to existing regulations, and BMP training is provided in all three of the state's professional logger training programs as referenced in the BMP section. Also, each of the state's professional logger training programs includes hazardous chemical spill prevention and control training. As noted in the RBA's BMP section, the total number of loggers actively participating in state logger training programs is as follows: Florida has 400 participants, Georgia has 1,400 participants, and South Carolina has 1,100 participants.

In the Florida manual, BMPs referencing chemicals, and oil are: Do not leave pesticide containers on site - these should be rinsed and disposed of according to the directions on the label (Florida Silviculture BMP Manual, pp 34), Proper collection and disposal of used oil is necessary to prevent soil and water contamination and to promote oil recycling (Florida Silviculture BMP Manual, pp 35), do not dispose of solid wastes, such as trash, litter, containers,

etc. into waterbodies of any kind (Florida Silviculture BMP Manual, pp 35), remove trash, litter and other solid wastes from project areas. In particular, remove and properly dispose of all chemical containers, hydraulic fluid and oil containers, oil filters, batteries, and tires (Florida Silviculture BMP Manual, pp 35)

Georgia's BMP manual makes references to waste: Dispose of oils, lubrications, their containers, and other wastes according to local, state, and federal regulations (Georgia Forestry BMP Manual, pp 42), Remove all used tires, batteries, oil cans, and trash from logging operations before leaving the site (Georgia Forestry BMP Manual, pp 42), Clean up and/or contain fuel and oil spills immediately. Comply with state and federal regulations when reporting spills. Report any fuel, oil, or chemical spills to the DNR EPD Hazardous Substance Office at 1-800-241-4113 (Georgia Forestry BMP Manual, pp 42), accidental oil spills, the spill be contained, contaminated soils be collected and delivered to approved waste handling facility, and EPD be notified (Georgia Forestry BMP Manual, pp 64). As well Pollutant is defined as 'Natural or manmade waste material that contaminates air, soil or water' (Georgia Forestry BMP Manual, pp 76).

South Carolina's BMP manual references waste in the following areas: Handle and store toxic and hazardous material such as fuels, lubricants, and solvents outside of the SMZ (SC Forestry BMP Manual, pp 8), Dispose of oils, lubricants, their containers and other wastes according to local, state, and federal regulations (SC Forestry BMP Manual, pp 35), Report any fuel, oil, or chemical spills to the Emergency Response Unit of the Department of Health and Environmental Control at 803- 53-6488 (SC Forestry BMP Manual, pp 35), avoid leaving (tree) planting bags or other garbage on the site (SC Forestry BMP Manual, pp 43), dispose of pesticide containers and/or excess pesticide according to state and federal regulations (SC Forestry BMP Manual, pp 47), clean up and/or contain all pesticide spills immediately and comply with state and federal regulations concerning re- porting spills of hazardous materials (SC Forestry BMP Manual, pp 47), properly dispose of fertilizer containers (SC Forestry BMP Manual, pp 48).

Given the training professional loggers receive on handling hazardous waste and spills combined with the high compliance rate of BMPs that include many references to chemicals, fuel and oil handling and proper disposal, we assess this indicator as low risk. Furthermore, the public assessment report of the ATFS certification scheme completed by the Dutch Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) concludes that Criterion 8.8 is fully addressed by State BMPs.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

PRINCIPLE 9: THE PRODUCTION CAPACITY FOR WOOD PRODUCTS AND RELEVANT NON-TIMBER FOREST PRODUCTS IS MAINTAINED IN ORDER TO SAFEGUARD THE FUTURE OF THE FORESTS.

CRITERION 9.1 The production capacity of all forest types represented in the forest management unit is maintained.

INDICATOR 9.1.1 There is a clear methodology to determine the Annual Allowable Cut (AAC) or harvest per forest type.

INDICATOR 9.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

Because Criterion 9.1 as written applies specifically to the FMU level, the Criterion and associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we use an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.

We conduct a qualitative assessment of standard operating procedures employed on Category 2 lands for determining AAC based on established and widely accepted silvicultural principles. We research certification standards, landowner guidance and other resources available through state and federal agencies. We consult the NWOS on landowner attitudes relating to sustainable harvest levels. We also conduct interviews with experts with experience working with family forest owners and knowledge of their behaviors relative to harvesting. Lastly, we review FIA growth and yield data for counties within the RBA region which provides quantitative analysis of trends in harvest levels as well as net volume of trees between the most current FIA measurement and the previous measurement.

ASSESSMENT OF CONFORMANCE:

The size of a forest management unit or property can have a significant influence on the practicality of determining AAC. For small tracts typically owned by family forest owners, with infrequent harvest entries, harvest levels are more appropriately determined based on an assessment of current forest conditions (including tree stocking levels), site productivity, and landowner objectives. Harvest prescriptions are designed to achieve a 'desired future condition' rather than by calculating AAC.

According to the 2018 NWOS, 58% of family forest ownerships in the southeast region are less than 10 acres in size, and 87% are less than 50 acres in size. These figures are corroborated for South Carolina where 60% of family forest ownerships are less than 10 acres in size, and 87% are less than 50 acres (Brandeis, et al. 2016, Table 2). Particularly on these smaller ownerships, the process for determining appropriate harvest levels is less formal than calculating an AAC and tends to be more focused on application of scientifically based, well established, and widely accepted silvicultural practices designed to specifically address landowner objectives, forest stand characteristics, productive capacity, and legal requirements. Often times a written plan is not produced, however foresters and professional loggers are involved in most timber harvests and all states in the RBA provide

excellent guidance, and consultations with agency foresters, that are available at no cost to landowners. While engagement levels vary, experts interviewed estimate 60% to 80% of family forest owners seek professional guidance from either a state forester or a consulting forester before making decisions about harvesting. This is particularly true of landowners who are relatively new to their properties. Those who have owned their lands for longer periods of time have acquired knowledge from past experience and tend to rely more heavily on trusted relationships with local forestry professionals and knowledgeable neighbors.

Experts in the region consistently describe a process consistent with the methodology described above. That is, in the majority of instances, family forest owners follow a common process for determining harvest levels on their forests: 1) establish goals and objectives for the property; 2) conduct a forest assessment (determine stocking, species, age, growth, health, productivity, other environmental factors); 3) assess markets; 4) define harvest prescription based on well-established silvicultural principles to match objectives to site conditions. This methodology is further codified in the dominant programming tailored to small landowners in the United States, including the Forest Stewardship Program, centrally funded by the US Forest Service, through congressional appropriation, and implemented at the state and local level, as well as the American Tree Farm System (ATFS), as outlined in its Standard 1.

Additionally, standards for the major certification systems that apply to family woodlands in the US, (e.g., FSC and ATFS) include requirements for ensuring the production capacity of forests is maintained through sustainable harvest levels. However, because current adoption rates of forest certification on forest lands within the RBA region are relatively insignificant, we do not believe certification has a material impact on harvest rates within the RBA and is most impactive in local settings where certified lands are concentrated within mill supply areas. Growth and yield data collected and summarized by the USFS via the FIA for several decades provides a consistent, accurate measurement of trends down to the county level. As described below in Indicator 9.1.2, harvest levels within the RBA region have consistently remained below growth rates. This data is perhaps the best substantiation that a clear and effective methodology is used to ensure the productive capacity of forests are maintained.

DISCLAIMERS AND CONSIDERATIONS

1. AFF's analysis and results are calculated in volume which do not translate to total acreage - for this reason Family Forest Ownership and Forested Area ratios have not been applied to the growth and yield results.
2. We cannot conclusively link FIA harvest rate trends to family woodlands specifically.

INDICATOR 9.1.2 The allowable harvest level is based on conservative, well-documented and most current estimates of growth and yield in order to not jeopardise the forest's productive potential in the medium to long term.

INDICATOR 9.1.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 9.1 as written applies specifically to the FMU level, the Criterion and associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we use an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.

We consult the NWOS on landowner attitudes relating to sustainable harvest levels. We research family forest owner behaviors relative to other landowner classes regarding intensity of management and harvesting practices. We also cite most recent FIA data on growth and yield for Florida, Georgia, and South Carolina. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

ASSESSMENT OF CONFORMANCE:

Growth and yield data from the USDA Forest Service FIA database are the most current and comprehensive measurement of forest inventories on all land ownerships across the United States. As shown in Risk Assessment Table IX, the sum total of the most recent FIA data for counties located within the RBA region, average annual net growth exceeds average annual harvest volumes in each state within the RBA region. This data clearly confirms that allowable harvest levels within the RBA region are not jeopardizing the forest's productive potential in the medium to long term. These numbers reflect all landowners. Our data for family forest ownership are based on area, not volume. Therefore, if family forest ownership ratios are applied to volumes, results will be distorted.

Risk Assessment Table IX: Average annual change in standing forest volume, RBA Region (Source: FIA, 2020)

STATE	Growth	Harvest	Net Change
Florida	792,891,486	389,164,628	403,726,858
Georgia	2,116,615,729	1,295,790,945	820,824,784
South Carolina	1,271,553,989	880.641,813	390,912,176
Total	**4,181,061,204**	**2,565,597,386**	**1,615,463,818**

Note: volumes reported in cubic meters, based on changes in volumes between the most current FIA measurement and the previous measurement.

Further, as noted in our assessment for Indicator 3.3.1, other analyses of growing stock inventories and harvest levels by ownership show that, despite owning a larger share of forests, family ownerships are not intensively managed as compared to other private timberlands. While all ownership classes show higher growth than removal volumes on all forest types combined, industrial lands have harvested in excess of growth on hardwood

types indicating a trend of converting hardwood stands to softwood plantations. This is not the case for family forest lands. And, standing growing stocks per acre are higher on family forest lands than any other ownership class except for public lands, while removal volumes per acre on family forest lands are below the average for all ownership classes. (Zhang, et al. 2012, pp359).

Also, as stated above for Indicator 9.1.1, family forest owners typically base their decisions on what, how much and when to harvest forest products by conducting a reconnaissance, or forest assessment, of current forest conditions, including stocking and growth. A harvest plan (e.g., silvicultural prescription) is then developed to match the landowner's objectives to site conditions in order to not jeopardize the forest's productive potential. Sometimes this process is captured in a management plan, but more commonly the process is informal and undocumented. As one regional expert stated, the nature of forest land ownership for small holders is to recognize the intrinsic value of the property. As such, family forest owners are strongly incentivized to take care of their property, and to maintain the health and productivity of the forest for the long term.

When responding to AFF's May 2020 questionnaire, only 4.4% of stakeholders who expressed an interest in the RBA region disagree that the production capacity of all forest types represented in family forest management units is maintained. Conversely, 70.6% agreed that production capacity in maintained, while 23.5% were neutral or had no opinion. Similar results were seen for all stakeholders providing a response to this question.

Lastly, family forest owner attitudes toward ownership of their lands clearly show a strong prioritization of noneconomic values over income generation, production of timber and non-timber forest products. Results from the most recent NWOS are presented in Risk Assessment Table X and indicate quite clearly that family forest owners are unlikely to engage in any activity, such as harvesting beyond sustainable levels, that could result in harm to the long-term productive capacity of their lands.

Risk Assessment Table X: NWOS Survey Results, Family Forest owners with properties greater than one acre.

Stated Reason for Owning Forestland	Very Important (%)	Important (%)
Beauty or scenery	64	24
Wildlife habitat	45	30
Nature Protection	43	28
Land investment	29	29
Timber Products	9	8
Non-Timber Forest Products	6	4

In summary, the risk of non-conformance to Indicator 9.1.2 is low for the following reasons:
1. The most recent FIA data shows clearly that annual growth exceeds annual harvest levels in each state within the RBA.
2. Family forest owners have been shown to manage their lands less intensively than other private forest owners, maintain higher growing stocks and have lower harvest volumes per acre; and,
3. NWOS survey results show family forest owners put a relatively low priority on harvesting timber and non-timber forest products from their lands and are therefore unlikely to engage in any activities that jeopardize the productive potential of their forests.

DISCLAIMERS AND CONSIDERATIONS

1. AFF's analysis and results are calculated in volume which do not translate to total acreage - for this reason Family Forest Ownership and Forested Area ratios have not been applied to the growth and yield results.

2. We cannot conclusively link FIA harvest rate trends to family woodlands specifically.

3. FIA data for changes in volume between the most recent FIA measurement and the immediately preceding measurement shows average annual declines in three species groups – Oak/Hickory (OkH), Elm/Ash/ Cottonwood (EAC), and "Other". The drop in volume for each species group is small when compared to starting volume - 0.1% for OkH and 1.15% for EAC. The "Other" grouping represents plots measured on sites that were previously forested and were non-forest at the most recent measurement.   The reduction in "Other" volume represents 0.2% of the total standing volume at the prior (immediately preceding) FIA measurement. These declines are so marginal as to be immaterial, and therefore we have not included this detail in our assessment of compliance. As detailed in our assessment above, total volume for each state and for the RBA region as a whole is increasing. These conclusions have been reinforced by state forestry experts.

INDICATOR 9.1.3 There are clear, accurate and up-to-date records of harvest volumes for all commercial timber species, and of the commercial harvest of any NTFPs.

INDICATOR 9.1.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 9.1 as written applies specifically to the FMU level, the Criterion and associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. It is impractical to verify that up-to-date records are kept for harvested timber and non-timber forest products on several hundred thousand individual FMUs. Therefore, we use an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.

We conducted a quantitative assessment of harvest data for commercial timber species via the FIA database and the NWOS results. We also conducted a qualitative assessment based on the very low percentage of FFO's in the Southeast who harvest NTFP for sale (5%).

ASSESSMENT OF COMPLIANCE:

Regarding harvest records for timber species, the National FIA Program is the most consistent and accurate source of timber harvest volumes in the United States. As noted above for Indicator 9.1.2, FIA data, encompassing all commercial species, shows very clearly that in all three states within the RBA region, net growth exceeds timber harvest levels.

The NWOS survey indicates that a very small percentage, 5%, of family forest owners in the southeast US harvest non-timber forest products for sale, while only 26% harvest non-timber forest products for personal use. Records of NTFP harvest are atypical and unnecessary for most instances of NTFP collection which tends to be low volume

and or incidental. There are some laws and regulations in Georgia and Florida for a few NTFPs, though only Georgia has a record of value of harvest for any NTFP. Pine straw value is recorded in the agriculture statistics in Georgia. We compare the value of Georgia's harvest with the amount of FFO's in Florida and South Carolina and adjust the value for these states. Due to the low participation of FFOs in commercial production of NTFPs, this indicator is a low risk from the outset.

There are some reports for the most widely harvested NTFPs in some of the states within the scope of this RBA. The University of Georgia publishes a Farm Gate Value Report that tracks the acreage of harvest and value to the producer, of pine straw. This report shows a gate value of $80.6 million for pine straw harvested across 573,000 acres. (GFVR 2018 pp 109-110)

Small amounts of American ginseng come from within the geography of this RBA. Harvest data from 2013 show the amount of American ginseng from Georgia at 346 pounds of the 75,892 pounds harvested, or less than .5% of the total. The harvest data for American ginseng is available for the last 40 years since the United States became a signatory to CITES. (SRS-GTR-232 pp 126)

The small percentage of family forest owners harvesting NTFPs for sale indicates that most NTFP collection is incidental and low volume. Given the small scale and low intensity harvesting of most NTFPs, maintaining harvest records is unnecessary. For larger scale commercial harvesting of some NTFPs, such as pine straw and ginseng, harvest records are maintained. Comprehensive timber harvest records are collected and maintained by the USDA Forest Service FIA program. On the basis of these observations, our conclusion is that the practical risk of non-conformance to Indicator 9.1.3, particularly when considered in the context of the Criterion (maintenance of the productive capacity of the forest), is low.

DISCLAIMERS AND CONSIDERATIONS:

1. AFF's analysis and results are calculated in volume which do not translate to total acreage - for this reason Family Forest Ownership and Forested Area ratios have not been applied to the growth and yield results.
2. We cannot conclusively link FIA harvest rate trends or NTFP harvest levels to family woodlands specifically.

CRITERION 9.2 The forest management unit is sufficiently protected against all forms of illegal exploitation of timber and non-timber forest products, including hunting and fishing, illegal establishment of settlements, illegal land use, illegally initiated fires, and any other illegal activities.

INDICATOR 9.2.1 The boundaries of the FMU have been clearly marked and mapped.

INDICATOR 9.2.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 9.2 and Indicator 9.2.1 as written apply specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. We researched property designations within the states and examine laws related to land and markings. We investigated the ability to publicly access spatial records of land parcels in each county with the record of ownership, value, etc. We also consulted the FSC US CW NRA and the USDA Forest Service NWOS.

ASSESSMENT OF COMPLIANCE:

The FSC-CW-NRA rates the United States as low risk for Indicator 1.1, Land tenure and management rights, stating, 'Land records in the United States are highly reliable. Banks routinely issue mortgages based on them. State laws govern the sale or transfer of rights to land, the rights of property owners and occupants, and the recording of land interests and rights to the land. Rights transfer from person to person based on the issuance of deeds, mortgages, and other granting instruments, and recording of these instruments provides possible purchasers with notice of claims to the land. Private companies called title insurers will search the records and issue limited guarantees stating that a particular seller has rights to convey. State (and in some cases federal) courts will resolve disputes over tenure rights.

In land transfers, it is necessary to legally describe the land parcel being transferred. These transfers are recorded in county level governmental offices. In each county within the scope of the RBA, local county administrative officials, most often tax or revenue assessor or collector, will maintain ownership, value, and tax assessment and payment records for each property within the county boundaries. In recent years, these official these records contain an online geospatial database of property ownership boundaries. These records are accessible to the public. Edgefield, South Carolina, Clinch County, Georgia, and Gadsden County, Florida are given as examples.

The National Woodland Owner Survey (NWOS) of family forest owners in the southeast US indicates that 78% of owners are concerned or greatly concerned with trespassing or poaching of wildlife and 63% of the family forest owners in the southeast covering 80% of the family forest acres, post or mark their land with signage against trespass and/or illegal hunting. This shows high compliance among family forest owners for marking their property boundaries. In addition, it is common practice among landowners to install gates on access roads to their property to dissuade trespassing.

Lastly, in their public report on the assessment of ATFS, even in the absence of certification, ADBE notes that various local, state, and federal laws are in place to prevent illegal activities.

Given that the majority of family forest owners surveyed mark their property boundaries and the online accessibility to geospatial boundaries of property from county level websites, we assess the risk for Indicator 9.2.1 to be low.

DISCLAIMERS AND CONSIDERATIONS:
None.

INDICATOR 9.2.2 Concrete measures are taken to prevent illegal harvesting, including of products of hunting and fishing, settlement, illegal land-use, illegal fires and any other unauthorised activities within the FMU.

INDICATOR 9.2.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Indicator 9.2.2 as written applies specifically to the FMU level, this Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. We conducted a qualitative assessment based on the laws, regulations, and processes in each state to prevent illegal harvesting, including products of hunting and fishing, settlement, illegal land-use, illegal fires, and other activities. We also use NWOS results to describe attitudes and measures of FFOs to prevent these actions. We reference the FSC US Controlled Wood National Risk Assessment evaluation of risk for illegal timber, and the World Bank ratings for Rule of Law and Control of Corruption. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

ASSESSMENT OF COMPLIANCE:
The National Woodland Owner Survey (NWOS) of family forest owners in the southeast US indicates that 78% of owners are concerned or greatly concerned with trespassing or poaching of wildlife, 74% are concerned over illegal trash dumping or vandalism. 63% of the family forest owners in the southeast covering 80% of the family forest acres, post or mark their land with signage against trespass and/or illegal hunting. This shows high compliance among family forest owners for marking their property boundaries. In addition, it is common practice among landowners to install gates on easements to their property to dissuade trespassing. As well, the survey indicates that 64% of family forest owners have a primary residence within 1 US mile (1.6 KM) of their forest property. Living in such close proximity to their forest lands means these landowners have convenient access to their property, allowing for frequent visits to monitor and report and illegal activities. These data suggest vigilance and action to dissuade illegal activities.

Furthermore, in response to AFF's May 2020 stakeholder questionnaire, 76.5% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that family forests are sufficiently protected against all forms of illegal exploitation of timber and non-timber forest products, including hunting and fishing, the illegal establishment of settlements, illegal land use, illegally initiated fires, and any other illegal activities. Only 4.4% disagreed or strongly disagreed and the remainder were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank.

The FSC CW NRA evaluated risk of sourcing illegally harvested wood. The result of the FSC's assessment is a determination of Low Risk throughout the conterminous US. The FSC-CW-NRA states, 'Identified laws are upheld. Cases where law/regulations are violated are efficiently followed up via preventive actions taken by the authorities and/or by the relevant entities. The FSC US CW NRA evaluates risk against several Indicators relating to upholding applicable laws on forest lands including land tenure rights, permits and licensing, payment of harvest fees, environmental requirements, etc. For Indicator 1.1 Land Tenure and Management Rights, the NRA points to several sources to substantiate a low-risk designation, including the US Department of Agriculture 2011 National Report on Sustainable Forests which states, "All forest landowners, public and private, exercise their forest tenure rights to achieve their forest and management goals… {A}although complex, clear title is usually sufficient in the United States". The exercising of property rights is inclusive of prevention of trespass of all kinds, including theft of forest products, illegal land use, poaching and arson.

The Seneca Creek Assessment of US Hardwoods (Seneca Creek Associates, LLC), section 5.5, pp 71 notes that according to the Uniform Crime Reporting Program maintained by the Federal Bureau of Investigation the frequency of property crime has declined in the United States, with the rate of larceny/theft in 2008 at 1,721 per 100,000 people for the US hardwood region (which include parts of SC and GA). The Seneca report concludes "low or negligible risk" of sourcing illegal and unsustainable timber in the US hardwood region, stating, among other things, "… well-established private timber ownership, robust and effective legal systems, the safety-net of national and state regulations and programs that address unlawful conduct and poor forest practices, the widespread use of trained loggers, the high rates of BMP compliance, the development of state comprehensive forest and wildlife resource assessments, and the proliferation of public/private sector conservation partnerships all contribute to this finding." Although the focus of the Seneca study is timber legality, the legal framework applies to all land tenure issues, including prevention of illegal land uses such as poaching, trespassing, arson, etc.

Given the FSC CW NRA findings, the conclusions of the Seneca study, the high Rule of Law index rating from the World Bank for the US, results of the NWOS, and results from the FSC US CW NRA this indicator is considered to be low risk.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 9.2.3 Appropriate measures are taken when illegal activities are detected.

INDICATOR 9.2.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 9.2 applies specifically to the FMU level, the Criterion and all associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. We conducted a qualitative assessment based on laws, regulations, and processes in the states. We also evaluated the roles state agencies for forestry and wildlife play in the enforcement of these laws as well as other local, state, and federal law enforcement agencies. We used NWOS results to examine FFOs attitudes toward illegal activities. We also reference the FSC US Controlled Wood National Risk Assessment evaluation of risk for illegal timber and World Bank ratings for governance.

ASSESSMENT OF COMPLIANCE:

In its report to the Montreal Process Working Group on the Conservation and Management of Temperate and Boreal Forests, discussing an indicator relating to land tenure, the US Forest Service concluded that, "All forest landowners, public and private, exercise their forest tenure rights to achieve their forest land management goals .... [A]although complex, clear title is usually sufficient [to allow forest management] in the United States. In cases where disagreements about land rights occur, courts provide a means to settle those conflicts." (US Department of Agriculture. 2011. National Report on Sustainable Forests—2010, p 111.)

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank.

The United States operates under a robust set of laws and regulations related to hunting, fishing, and trapping in each state. Under the doctrine of public trust, all the people of a state, represented by the state government, are the collective owners and have responsibility for all wildlife occurring within its boundaries. Exceptions to this state ownership and responsibility are for wildlife occurring on land owned by the federal government, species noted in international treaties or protected under federal law, which become federal trust wildlife. Another exception to the state public trust doctrine is wildlife occurring on tribal lands, which fall under the purview of the native tribe and/or the US Department of Interior, Bureau of Indian Affairs. This public trust doctrine, which has been affirmed by the judicial system in the United States, allows the passage of laws and regulations that forbid or control the time, place, and manner of the private taking of various mammals, fish, and birds within a state.

Permits (licenses) are required in each state for anyone over the age of 16, including Georgia, Florida, and South Carolina to hunt, fish or trap game species and each of the state governments have wildlife law enforcement actively enforcing the rules and regulations concerning hunting, fishing, and trapping. Extensive publications on

hunting, fishing, and trapping laws and regulations are published and widely available, both in print on online, for public consumption. Each state publishes annual updates of regulations for hunting, fishing, and trapping, e.g., "Georgia Hunting Seasons and Regulations, July 2020 – June 2021".

The National Woodland Owner Survey (NWOS) of family forest owners in the southeast US indicates that 78% of owners are concerned or greatly concerned with trespassing or poaching of wildlife and 63% of the family forest owners in the southeast covering 80% of the family forest acres, post or mark their land with signage against trespass and/or illegal hunting. This shows a strong compliance attitude toward legal hunting and fishing.

The FSC US Controlled Wood National Risk Assessment (FSC US NRA), which is a product of a comprehensive multi-stakeholder process taking place over a period of over five years has concluded low risk for sourcing illegal wood throughout the conterminous United States, including the entire RBA region. The FSC US NRA evaluated 21 discrete Indicators of legality ranging from tenure, to environmental protection and regulatory control.   The FSC-CW-NRA states, 'Identified laws are upheld. Cases where law/regulations are violated are efficiently followed up via preventive actions taken by the authorities and/or by the relevant entities.

In summary, there is a strong adherence to the rule of law in the United States as evidenced by high ratings for Rule of Law and Control of Corruption issued by the World Bank. State and federal agencies actively enforce regulations governing forest level activities including conservation of resources, trespass, and private property rights. NWOS results show family forest owners express strong concern for protection of wildlife and their properties from illegal activities. Given this assessment, we find there is a low risk for of non-conformance to this indicator.

DISCLAIMERS AND CONSIDERATIONS:

None

PRINCIPLE 10: SUSTAINABLE FOREST MANAGEMENT IS ACHIEVED THROUGH A MANAGEMENT SYSTEM.

CRITERION 10.1 The forest management system is designed to achieve the objectives of a forest management plan and covers the inventory, analysis, planning, implementation, monitoring, evaluation, and adjustment cycle.

INDICATOR 10.1.1 Policies and operational management objectives shall exist for the FMU and shall at least meet national and regional legal requirements.

INDICATOR 10.1.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Because Indicator 10.1.1 applies specifically to the FMU level, it cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

As indicated above, we apply the indicator to all Category 2 lands collectively within the RBA rather than at the FMU level. Furthermore, the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners. In other words, a traditional comprehensive management plan document is not always necessary for small scale and low intensity operations on family forest lands. Alternative, non-traditional approaches that provide the necessary level of guidance and due diligence can be considered sufficient in these instances. We conducted a qualitative review of existing management plan standards and content requirements including ATFS, Forest Stewardship Program (FSP), SFI and FSC. Review of relevant federal and state laws and regulations. Consideration of landowner behaviors regarding management planning as reported through the NWOS. Consultations with experts and industry professionals.

ASSESSMENT OF COMPLIANCE:

All forest management policies and practices in the United States must follow federal law and relevant state laws. Examples of federal laws that influence forest management in the United States include the Endangered Species Act, The Migratory Bird Treaty Act, and the Clean Water Act. Breaking any of these laws is a federal offense and will lead to federal-level sentencing. The analyses and determination for SDE+ criteria/indicators 6.1.1 - 6.3.1 further examine ways in which forestry professionals typically maintain legal compliance in the United States. States also enact their own regulations around forest management, some of which are legally mandated. For example, the states in this geography have laws pertaining to timber theft and fraud, environment and public safety, and the use of fire. Furthermore, the states in this geography have regulations preventing the spread of noxious weeds, use of chemical applications, best management practices to protect soil and water quality, and at-risk species. It is common practice among foresters and forest managers to be trained and knowledgeable about these laws and regulations, as was confirmed by multiple consultations (which are listed in the Bibliography). As such, the imposition of these frameworks, in essence, constitute operational policies that apply to the parcel level and are consistent with state and federal law.

This is also reinforced within the standards and guidelines of the most common certification schemes including ATFS, SFI, and FSC. Similarly, FSP operated by the US Forest Service in cooperation with state forestry agencies, cooperative extension, and conservation districts also aids small, private landowners in development and implementation of forest management plans. Despite these initiatives, according to the most recent NWOS, only 14% of family forest ownerships, representing 35% of family forest lands in the southeast region have forest management plans (Butler, 2018). The majority of family forest ownerships (86%) do not have plans.

As we showed in our assessment for Indicator 9.1.1, in the majority of instances, family forest owners follow a common process for making management and operational decisions. Significant management interventions tend to occur infrequently on family forest lands. According to the 2018 NWOS, on properties of at least one acre in size, only 23% of family forest owners in the southeast region have harvested timber for sale during their tenure. By comparison, 24% have harvested timber for personal reasons (e.g., firewood) and 51% have not harvested timber for any reason. For context, 82% of these owners representing 85% of the family forest acres in the southeast have owned their lands for 10 years or longer. Experts in the region consistently describe a process that involves establishing objectives and formulating a plan of action to match objectives to site conditions. In other words, even in the absence of documented policies or plans, family forest owners in the RBA region do have at least informal yet guiding policies and plans that guide their management actions.

To summarize, keeping in mind the small scale and low intensity of management activities typical of family forest lands, and in consideration of the strong regulatory and enforcement framework in place throughout the US, and recognizing that family forest owners commonly have at minimum an informal set of objectives and plans to guide their forest management actions, we have concluded there is a low risk of non-conformance with Indicator 10.1.1.

DISCLAIMERS AND CONSIDERATIONS:
None.

INDICATOR 10.1.2 Depending on the scale and intensity of the forest management, a management plan and/or supporting documents shall exist for the FMU. This management plan shall include the long-term management objectives and a description of the inventory, planning, monitoring and evaluation cycle. An Environmental Impact Assessment is part of the planning.

INDICATOR 10.1.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Because Indicator 10.1.2 applies specifically to the FMU level, it cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Refer to Assessment Methodology for Indicator 10.1.1. Importantly, we consider the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners. In other words, a traditional comprehensive management plan document is not always necessary for small scale and low intensity operations on family forest lands. Alternative, non-traditional approaches that provide the necessary level of guidance and due diligence can be considered sufficient in these instances. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

ASSESSMENT OF COMPLIANCE:

This criterion is reinforced within the standards and guidelines of the most common certification schemes including ATFS, SFI, and FSC. Similarly, the Forest Stewardship Program operated by the US Forest Service in cooperation with state forestry agencies, cooperative extension, and conservation districts also aids small, private landowners in development and implementation of forest management plans. Despite these initiatives, according to the most recent data from the NWOS, Only 14% of family forest ownerships, representing 35% of family forest lands in the southeast region have forest management plans (Butler, 2018). Statewide data taken from the 2020 USFS State and Private Forestry Fact Sheets for Florida, Georgia and South Carolina indicate that 116,342 acres, or less than 1% of all family forest owned (FFO) lands are covered by a Forest Stewardship Program management plan. See Table XI below.

Risk Assessment Table XI: Proportion of family forest owned (FFO) area by state enrolled in FSP.

STATE	Total Forst Area (Ac.)	FFO Area (Ac.)	Forest Stewardship Program	
			Area (Ac.)	% of FFO Area
Florida	17,052,566	9,652,000	35,329	0.37%
Georgia	24,520,480	18,172,000	70,715	0.39%
South Carolina	12,857,041	9,712,000	10,298	0.11%
Total	54,430,087	37,536,000	116,342	0.31%

Formal environmental assessments, such as those conducted at the federal level under the National Environmental Policy Act, are not required for managing privately-owned family forest lands. However, as we showed in our assessment for Indicator 9.1.1, professional foresters do typically conduct a thorough evaluation of a property when working with a landowner on a management plan, which commonly includes methods such as forest inventory, assessing soil condition and health, mapping sensitive sites and riparian areas, and looking for cultural resources.

In the context of a "forest management system" as stated in Criterion 10.1, state forestry experts in the region consistently describe a process that involves establishing objectives and formulating a plan of action to match objectives to site conditions. In other words, even in the absence of documented policies or plans, family forest owners in the RBA region do typically follow a common methodology on their forests that includes establishment of goals and objectives for the property, an assessment of forest attributes, and planning and implementation of management activities to match objectives and site conditions. Experts interviewed estimate 60% to 80% of family forest owners seek professional guidance from either a state forester or a consulting forester before making decisions about harvesting. This is particularly true of landowners who are relatively new to their properties. Those who have owned their lands for longer periods of time have acquired knowledge from past experience and tend to rely more heavily on trusted relationships with local forestry professionals and knowledgeable neighbors.

Furthermore, in response to AFF's May 2020 stakeholder questionnaire, 89.7% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that management of family forests is designed to achieve the objectives of a forest management plan and covers inventory, analysis, planning, implementation, monitoring, and evaluation. Only 4.4% disagreed or strongly disagreed and 5.9% were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

In summary, while recent data indicates only a minority (14%) of family forest owners, representing 35% of family forest lands within the southeast region have written management plans, the majority of these landowners do follow a common process that effectively functions as a management planning system. Indicator 10.1.2 specifically invokes scale and intensity as a qualifier for evaluating the presence of a management plan. In our assessment, we have found that most landowners employ at minimum informal management systems that provide the necessary level of due diligence and guidance to be credible and effective options for family forest owners. Consequently, we have concluded low risk for Indicator 10.1.2.

DISCLAIMERS AND CONSIDERATIONS:

1. Two considerations were central to our determination of low risk for Indicator 10.1.2. First, Criterion 10.1 is written in the context of a forest management "system" and as such does not specifically refer to the presence of a documented management plan. Second, consistent with instructions in the VP, and as explicitly mentioned in Indicator 10.1.2, scale and intensity of operations should be taken into consideration when evaluating compliance. As such, we conclude that the presence of a documented management plan is not a prerequisite for demonstrating that a management system is employed. Note that we have concluded specified risk for Criterion 10.2 due to the low adoption rate of documented management plans among family forest owners.

2. Acreages reported in Table XI differ slightly from those reported elsewhere in the RBA report due to timing and source of data. Data in Table XI is sourced from USDA Forest Service 2020 State and Private Forestry Fact Sheets for each state, available on-line, whereas data reported elsewhere in this report is sourced directly from the FIA database and is typically specific to the RBA region. Only a portion of Florida is included in the RBA region.

3. Formal environmental impact assessments are not typically conducted on family forest lands, even for those with forest management plans, but whether or not this is a vulnerability partly depends on what qualifies as an "environmental impact assessment" in the VP.

CRITERION 10.2 A forest management plan is drawn up that at least includes:

- **a description of the current condition of the forest management unit;**
- **long-term goals for the ecological functions of the forest management unit;**
- **the annual allowable cut per forest type and, if applicable, the annual allowable harvest of non-timber forest products based on reliable and current data;**
- **budget planning for the implementation of the forest management plan.**

INDICATOR 10.2.1 A forest management plan includes the long-term management objectives for the FMU, with due regard for ecological (species, ecosystems, functions) aspects. The forest management plan shall contain at least the following information:

- a description of the inventory and analysis, planning implementation, monitoring, evaluation, and review cycle;
- a description of the current state of the FMU;
- long-term objectives aimed at ecological functions;
- the average annual harvest permitted per forest type and, if applicable, the annual exploitation of non-timber forest products permissible, calculated on the basis of reliable and up-to-date data.

INDICATOR 10.2.1 RISK RATING	Specified
ALTERNATIVE MEANS OF VERIFICATION	Because Indicator 10.2.1 applies specifically to the FMU level, it cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. Importantly, we consider the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners. In other words, a traditional comprehensive management plan document is not always necessary for small scale and low intensity operations on family forest lands. Alternative, non-traditional approaches that provide the necessary level of guidance and due diligence can be considered sufficient in these instances.
MITIGATION (IF NEEDED)	To address specified risks for presence and quality of management plans, per this indicator, pellet producers must implement specific mitigation utilizing and expanding LMP use, combined with monitoring over the duration of RBA use, proportionate to their Category 2 sourcing. Specific mitigation requirements for this indicator are outlined below and, more broadly, in the RBA's mitigation section

MITIGATION REQUIREMENTS

Landscape Management Plan Use:

The SDE+ requirements include specifications for management plans, which can only be achieved using landscape management plans, given the costs and limitations of individual management plans, as well as their limited adoption by Category 2 family landowners in the United States. (See Annex IV for an overview of LMPs.) As such, all RBA users are reliant on the development, implementation, monitoring, maintenance, and improvement of LMPs.

At the mill level, pellet producers must demonstrate that a Category 2 land area, commensurate with the production of the specified volume of pellets (see Calibrating Thresholds for Mitigation), is newly enrolled for management under the LMP in the year the wood is harvested and related SDE+ conformity year statement timeframe. A pellet producer must maintain the previous year's LMP enrolled land base, while adding new acres under LMP management in their current year, for the duration of their use of the RBA and approved use of the VP under Dutch law. The pool of acres managed under the LMP must be maintained and verified in monitoring (outlined below). In the case that, though annual monitoring by AFF, it is observed that acres enrolled in a past year are no longer adhering to an LMP, the pellet producer must recruit additional, new acres under LMP use to compensate.

LMPs that comply with the SDE+ requirements for management plans were established (in Georgia and South Carolina) or augmented (Florida) in each of the states within the scope of this RBA over the course of 2020. RBA users must provide monetary support to AFF for LMP maintenance, including engagement and training amongst the broader community of foresters and technical service providers, necessary revisions, technological updates, and other critical activities.

Unit of mitigation: Acre recruited and under management supported by LMP use within the sourcing region.

Evidence provided by pellet producer:
- Documentation of LMP establishment (2020)
- Documentation of financial support to AFF for implementation and maintenance of LMPs applying to their roundwood sourcing area
- Documentation (using standardized format and platform) of Category 2 acres recruited for management under LMP based on calibration of required land area to produce claimed SDE+ volume per year, per Calibrating Thresholds for Mitigation section. Documentation includes landowner name, location of property, number of acres recruited and date of subscription to management under the LMP.
- Documentation of aggregated, retained Category 2 acreage pool under LMP management, including newly recruited replacement acres, if there is attrition of Category 2 acres from LMP supported management.
- Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

Monitoring and effectiveness evaluation:
To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating the effectiveness of this mitigation measure. As such, RBA users must provide AFF with standardized documentation of LMP use within their roundwood sourcing regions and secure egress to landowners' properties for monitoring. Monitoring will include confirmation that

forest management, as supported by the LMP is continued. Though it is not required, this may occur with the greatest ease and lowest cost through the ATFS program for subpopulation sampling. RBA users must provide monetary support for this function to AFF and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

ASSESSMENT METHODOLOGY

Qualitative; there is clear redundancy between this indicator and that of 10.1.2, which requires a management plan that includes "*the long-term management objectives and a description of the inventory, planning, monitoring and evaluation cycle.*" For this reason, the analyses for 10.2.1 shares similarities with the analyses completed for 10.1.2.

ASSESSMENT OF COMPLIANCE:

As outlined above, according to the most recently available data, only 14% of family forest ownerships, representing 35% of family forest lands in the southeast region have forest management plans (Butler, 2018).

Ongoing outreach efforts such as the ATFS, the Forest Stewardship Program (FSP) and other state-level initiatives are aimed at increasing the number of landowners connected to professional foresters and/or biologists, and/ or increasing the number of site visits by professionals. These efforts contribute toward adoption of sustainable management practices and management plans on family forest lands. Under these programs, professionals assist landowners by providing technical information and guidance in the stewardship of forest land, even if the outcome is not a formal, traditional forest management plan. Increasingly, the family forest assistance community, including the USDA Forest Service and FSP leadership in a 2013 effectiveness evaluation, has recognized that individual management plans are an expensive intervention that are limited in appeal to a wide spectrum of landowners and may not yield behavior change and forest management that produces desired public good.

We propose that this indicator can be interpreted to include reasonable proxies for a formal, comprehensive FMP document if directly guided by a professional who ensures fundamental planning and assessment takes place, and if appropriate documentation is available. In these instances, appropriate documentation might include, for example, an assortment of records, reports or chronicles that collectively demonstrate an appropriate level of due diligence, planning and guidance such as annotated maps, harvest prescriptions or directions, correspondence outlining objectives and site conditions, etc.

Formal environmental assessments, such as those conducted at the federal level under the National Environmental Policy Act, are not required for managing privately-owned family forest lands. However, professional foresters do conduct through evaluation of a property when working with a landowner on a management plan, which commonly includes methods such as forest inventory, assessing soil condition and health, mapping sensitive sites and riparian areas, and looking for cultural resources.

The primary reason most forest landowners do not have a management plan is simply because obtaining one is a costly and time-consuming process. Limitations on forester capacity often leads to weeks or months before a landowner might receive a plan. To address these barriers, AFF has developed an innovative approach: Landscape Management Plans (LMPs). LMPs are forest management plans written for an entire region instead of an individual parcel of land, and therefore eliminate the need for every landowner to develop and maintain

an individual management plan. With an LMP, landowners still receive a customized plan of action and guidance from their forester about how to manage their forests independently, but the time and paperwork required to produce this plan are significantly reduced.

An LMP is easy to find online and is publicly available, so both foresters and landowners are able to access it. Since their inception, LMPs have facilitated landowner engagement in forest conservation, provided technical assistance and resources to help landowners meet short- and long-term goals, helped sustain forests, and protected critical ecological, social, and economic services.

The first LMP was developed in 2018 by AFF in partnership with multiple agencies, academic institutions, conservation organizations, associations, and industry stakeholders. The original version included 16 counties covering the northern third of Florida. Today the Florida LMP includes the entire state. LMPs have been completed in 2020 for Georgia and South Carolina. Although each state's LMP has been developed using the same framework, each is unique to its state's characteristics and geography, and the administration and management vary from state to state.

An LMP is a critical component of landscape-scale and risk-based approaches to sustainability verification because it addresses sustainable forest management planning requirements cost-effectively and at scale. It can also increase landowner access to and participation in certification and assistance programs, such as the ATFS the FSP, and Natural Resource Conservation Service (NRCS) cost-share programs. The LMPs will therefore serve as an important mitigation tool, significantly increasing the rate at which comprehensive, adaptive management planning is implemented on family forest lands.

In summary, despite progress made in promoting management plans for family forests primarily through ATFS and FSP initiatives, due to the low rate of adoption of certification and the overall lack of documented management plans on the majority of family forest lands within the RBA, we are unable to provide supporting evidence to justify a low-risk designation for the presence of management plans. Consequently, we have concluded specified risk for Indicator 10.2.1. Our mitigation strategy relies heavily on adoption of LMPs within BP sourcing areas.

DISCLAIMERS AND CONSIDERATIONS:

It should be noted that using ATFS LMPs for mitigation may not meet the following stipulation at face value: the average annual harvest permitted per forest type and, if applicable, the annual exploitation of non-timber forest products permissible, calculated on the basis of reliable and up-to-date data. This is due to the scale at which an LMP is written versus the scale at which it is implemented. LMPs do not contain stand or FMU level information particular to a landowner's property. As we noted under Indicator 9.1.1, the process for determining appropriate harvest levels on family forest lands is often less formal than calculating an AAC and tends to be more focused on application of scientifically based, well established, and widely accepted silvicultural practices designed to specifically address landowner objectives, forest stand characteristics, productive capacity, and legal requirements. However, forestry professionals utilize the LMP to guide management actions, while they themselves gather and incorporate stand-specific and FMU level information into their management decisions and technical assistance. Refer to the LMP overview section for further details about how the LMP works at different scales.

Essential elements for the management of the forest are indicated on maps.

INDICATOR 10.3.1 There are appropriate maps of the forest resource base, including protected areas, planned management and land ownership.

INDICATOR 10.3.2 Before the commencement of harvesting and road construction, clear and accessible maps are made available describing the forest resource base and the boundaries of the FMU including areas with special ecological, archaeological, or cultural values, areas reserved for wildlife and areas where harvesting takes place.

INDICATOR 10.3.1 & 10.3.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Providing examples of maps used in normal operations, site specific, containing the above content with personally identifiable information redacted, and any other documentation from producers/mills indicating processes for making maps and other supportive documentation.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Reviewing common practice of forestry professionals as well as requirements under ATFS and other certifications, to produce and utilize maps of harvest areas. Consultation with professionals confirmed this practice. Indicators 10.3.1-10.3.2 are tied together as 10.3.1 requires the existence of maps and 10.3.2 details what those maps should contain. We considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region. We also take into consideration that the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners to the extent that they provide the necessary level of guidance and due diligence.

ASSESSMENT OF COMPLIANCE:

It is common and standard practice for foresters and forest industry professionals to create maps of a harvest area prior to harvest and in general during planning. Aside from foresters, loggers themselves require detailed maps in order to appropriately conduct a harvest operation. This practice is reflected in the standards of common certification requirements including American Tree Farm System (ATFS). As well, consultations with industry professionals confirmed this practice.

Furthermore, in response to AFF's May 2020 stakeholder questionnaire, 80.9% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that essential elements for the management of the forest are indicated on maps. Only 7.4% disagreed or strongly disagreed and 11.8% were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

Consultations with biomass producers provided evidence that mapping harvest areas and specific management areas is common practice. Producers described using maps provided from NRCS to monitor carbon levels over time (i.e., rapid carbon assessment), as well as to create detailed soil maps, which informs management strategy

and harvest operations. Additionally, it is common for biomass producers in the scope of this RBA to utilize FSC CW NRA maps to identify and highlight high conservation value and at-risk areas. Our consultations also indicated that it is customary for producers to include maps of sensitive or special sites as part of the contract and other documentation provided to suppliers, and to ensure everyone involved in procurement and supply is aware of HCVs identified on maps.

DISCLAIMERS AND CONSIDERATIONS:
None.

CRITERION 10.4 **The implementation of the forest management plan is periodically monitored, and the ecological effects of the forest management are evaluated.**

INDICATOR 10.4.1 Procedures for collecting the monitoring data have been clearly documented and are consistent and replicable over time to allow comparison and assessment of change.

INDICATOR 10.4.2 The frequency, intensity and expense of the monitoring activities are defined and are appropriate to the scale, intensity, and risks of the forest operations, as well as to the relative complexity and fragility of the resources under management. Monitoring shall at least include the following information in order to facilitate evaluation:

- data collected during surveys before and after harvesting and the generic inventories in order to identify and describe key changes in forest flora over time;
- data on the presence of key fauna species within the FMU, sufficiently so to allow identification and description of significant changes in the population over time;
- data aimed at demonstrating the conservation of high protection values and representative sites of forest types within the FMU.

INDICATOR 10.4.1 & 10.4.2 RISK RATING	Specified
ALTERNATIVE MEANS OF VERIFICATION	Yes, see Assessment Methodology section
MITIGATION (IF NEEDED)	To address specified risks associated with the lack of management plans and associated monitoring, per this indicator, pellet producers must implement specific mitigation utilizing and expanding LMP use, combined with monitoring over the duration of RBA use, proportionate to their Category 2 sourcing. LMPs address site-level monitoring throughout with reference to a range of attributes and activities including timber harvests (before, during, after), prescribed burns, invasive species and related treatments, endangered species, special sites, and changes in conditions that could impact achievement of management objectives. Additionally, the LMPs themselves will be monitored and adapted as necessary to account for changing conditions. LMPs are entirely inclusive of all ATFS and FSP requirements, including monitoring. The LMPs will therefore serve as an important mitigation tool, significantly increasing the rate at which comprehensive, adaptive management planning is implemented and monitored on family forestland. Specific mitigation requirements for this indicator are outlined below and, more broadly, in the RBA's mitigation section

MITIGATION REQUIREMENTS

Landscape Management Plan Use:

The SDE+ requirements include specifications for management plans, which can only be achieved using landscape management plans, given the costs and limitations of individual management plans, as well as their limited adoption by Category 2 family landowners in the United States. (See Annex IV for an overview of LMPs.) As such, all RBA users are reliant on the development, implementation, monitoring, maintenance, and improvement of LMPs.

At the mill level, pellet producers must demonstrate that a Category 2 land area, commensurate with the production of the specified volume of pellets (see Calibrating Thresholds for Mitigation), is newly enrolled for management under the LMP in the year the wood is harvested and related SDE+ conformity year statement timeframe. A pellet producer must maintain the previous year's LMP enrolled land base, while adding new acres under LMP management in their current year, for the duration of their use of the RBA and approved use of the VP under Dutch law. The pool of acres managed under the LMP must be maintained and verified in monitoring (outlined below). In the case that, though annual monitoring by AFF, it is observed that acres enrolled in a past year are removed from LMP, the pellet producer must recruit additional, new acres under LMP use to compensate.

LMPs that comply with the SDE+ requirements for management plans were established (in Georgia and South Carolina) or augmented (Florida) in each of the states within the scope of this RBA over the course of 2020. RBA users must provide monetary support to AFF for LMP maintenance, including engagement and training amongst the broader community of foresters and technical service providers, necessary revisions, technological updates, and other critical activities.

Unit of mitigation: Acre recruited and under management supported by LMP use within the sourcing region.

Evidence provided by pellet producer:

- Documentation of LMP establishment (2020)
- Documentation of financial support to AFF for implementation and maintenance of LMPs applying to their roundwood sourcing area
- Documentation (using standardized format and platform) of Category 2 acres recruited for management under LMP based on calibration of required land area to produce claimed SDE+ volume per year, per Calibrating Thresholds for Mitigation section. Documentation includes landowner name, location of property, number of acres recruited and date of subscription to management under the LMP.
- Documentation of aggregated, retained Category 2 acreage pool under LMP management, including newly recruited replacement acres, if there is attrition of Category 2 acres from LMP supported management.
- Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating the effectiveness of this mitigation measure. As such, RBA users must provide AFF with standardized documentation of LMP use within their roundwood sourcing regions and secure egress to landowners' properties for monitoring. Monitoring will include confirmation that forest management, as supported by the LMP is continued. Though it is not required, this may occur with the greatest ease and lowest cost through the ATFS program for subpopulation sampling. RBA users must provide monetary support for this function to AFF and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

ASSESSMENT METHODOLOGY

As with other criteria relating to management plans, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU.The indicators 10.4.1 and 10.4.2 both address monitoring procedures for the FMP, with 10.4.1 requiring that such procedures be clearly documented and replicable, and 10.4.2 detailing what those procedures should include. Since the evidence of documentation and process of monitoring will include the pieces required in 10.4.2, these indicators are addressed jointly below. This assessment reviews monitoring standards associated with common practices for FMP monitoring of family landowner operations, as well as landowner engagement programs and certification systems and consulted stakeholders and experts. We considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region. In our assessment of risk and design of mitigation measures we consider that Indicator 10.4.2 explicitly states the "frequency, intensity and expense of the monitoring activities are defined and are appropriate to the scale, intensity and risks of the forest operations."

ASSESSMENT OF COMPLIANCE:

Criterion 10.4 is predicated upon the implementation of an FMP, and therefore risk is specified due to a lack of FMPs among family forest landowners (based on FIA and NWOS data) within the RBA region. According to the most recent data from the NWOS, only 14% of family forest ownerships, representing 35% of family forest lands in the southeast region have forest management plans (Butler, 2018). Landowners without forest management plans may implement informal monitoring of their property, however a formal monitoring program is more likely to be consistent with the use of an FMP or LMP, such as those offered and implemented through the US Forest Service's Forest Stewardship Program or the ATFS, due to the difficulty and/or technical expertise that would be required.

For those providing a response to AFF's May 2020 stakeholder questionnaire, 73.5% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that the implementation of management plans on family forests is periodically monitored, and the ecological effects of forest management are evaluated. Only 7.4% disagreed or strongly disagreed and 19.1% were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

In general, family landowner engagement programs in the US, such as FSP and ATFS, as well as the ATFS and FSC certification standards include requirements for periodic monitoring by landowners. However, as noted under Indicator 10.1.1, these certification schemes have limited uptake among family forest owners within the RBA region.

Generally, the frequency, intensity and expense of monitoring is relatively low, based on the low intensity of management associated with Category 2 lands and the inherently low risk associated with infrequent, small-scale harvests driven by objectives unrelated to production and income generation. As such, monitoring of forest management plans, where used be it through individual or landscape plans, is generally scaled for typical family landowner operations, in accordance with this requirement, when an FMP or LMP is in place. Stakeholder feedback supports this observation.

However, as noted above, because adoption of management plans, of either sort, remains low.. Consequently, we have concluded specified risk is the appropriate designation for Criterion 10.4.

DISCLAIMERS AND CONSIDERATIONS:

None

CRITERION 10.5 The FMP is implemented by professional office and field staff, whose expertise and knowledge is maintained by means of an effective and regular training Programme.

INDICATOR 10.5.1 Competence/training requirements for all employees are identified and necessary (periodic) training is provided to ensure employees are sufficiently qualified and trained to perform their tasks.

INDICATOR 10.5.1 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 10.5 applies specifically to the FMP, which in turn is specifically applicable to the FMU level, the Criterion and all associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. Our risk assessment is focused on established standards for professionalism within the RBA region rather than competency and training requirements established by individual family forest owners.

We also consider the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners. In other words, a traditional comprehensive management plan document is not always necessary for small scale and low intensity operations on family forest lands. Alternative, non-traditional approaches that provide the necessary level of guidance and due diligence can be considered sufficient in these instances. We also considered relevant responses to the May 2020 AFF stakeholder questionnaire, focusing on respondents who expressed an interest in the RBA region.

We conducted quantitative and qualitative assessments based on the less intensive forest management of FFOs. We consult the NWOS results for data linking the percentage of FFO who received professional forestry advice to the percentage of those who perform forestry activities on the property, as well as landowner attitudes regarding stewardship values. We researched the training and/or requirements of state and private foresters, loggers, and contractors within the RBA geography. We investigated the quantity of foresters, loggers, and contractors available within the RBA geography. We consulted BMP implementation rates as a proxy for qualifications and competency of forest workers.

ASSESSMENT OF COMPLIANCE:

Largely due to the small scale and sporadic forest management activity associated with family forests, landowners typically do not support staff in the management of their forest lands. Instead, forest management professionals are hired as contractors on an "as needed" basis, and some landowners may choose to do some of the 'light duty' activities themselves.   As such, family forest owners do not set forth competency and training requirements beyond commonly accepted industry standards.   Our risk assessment is focused on established standards for professionalism within the RBA region.

Data from the NWOS indicates that while only 35% of family forest lands in the southeast region are covered by a written management plan, 30% of lands have plans written by a professional forester. In other words, 85.7% of management plans on family forests are authored by foresters. Further, 64% of family forest owners indicate trees have been harvested on their properties, representing 80% of the family forest land area. Foresters were engaged in harvests on 55% of the family forest area, meaning foresters were used on 68.75% of the harvested area.

Furthermore, in response to AFF's May 2020 stakeholder questionnaire, 73.5% of stakeholders expressing an interest in one of three states in the RBA region agreed or strongly agreed that management activities on family forest lands are implemented by qualified individuals whose expertise and knowledge are maintained by effective and regular training programs. Only 5.9% disagreed and 20.6% were neutral or had no opinion. Refer to the stakeholder summary section of the RBA for further details on methodology as well as the number and range of stakeholders consulted.

As noted for Criteria under Principle 8, all three states in the RBA region maintain active professional logger education programs (Florida Master Logger Program, Georgia Master Timber Harvester Program, South Carolina Timber Operations Professional Program). All three programs cover a comprehensive set of relevant topics including BMPs, legal requirements, protection of threatened species and sensitive sites. All provide a 2-day initial training with continuing education in subsequent years. All programs are attended by the majority of professional loggers operating in each state: Georgia has just under 1,400 active participants, Florida has over 400 participants and South Carolina has over 1,100 participants. Based on interviews, pellet producers in the region include training requirements for their suppliers. The BMP programs in these states are widely used and report rates of compliance between 88-98%.

Other resource management professionals providing services to family forest owners such as pesticide application and prescribed burning also carry corresponding licenses and/or related training credentials.

Lastly, each state also operates robust landowner education and outreach programs through land grant university extension programs, state forestry commissions, Forest Stewardship Programs, and other services such as the Georgia Small Landowner Program. All of these programs provide a wide range of resources to family forest at no cost, including direct assistance from professional foresters.

The risk of non-compliance with Indicator 10.5.1 is designated as low for the following reasons:
• Foresters are directly engaged in nearly 70% of timber harvests on family forest lands in the southeastern US;
• Professional logger training programs are well attended in each state within the RBA region;
• Biomass producers within the RBA region require logger training of their suppliers;
• BMPs are implemented at an extremely high rate in all three states indicating forest workers are trained and competent; and,
• Direct assistance from professional foresters, as well as a wide range of resources, are made available to family forest owners at no cost.
The combined effect of these factors demonstrates a strong likelihood that forest workers are appropriately trained, competent and capable of performing their forest management tasks.

DISCLAIMERS AND CONSIDERATIONS:

1. We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

INDICATOR 10.5.2 Appropriate employee qualification is available.

INDICATOR 10.5.2 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

Because Criterion 10.5 applies specifically to the FMP, which in turn is specifically applicable to the FMU level, the Criterion and all associated Indicators cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. Our risk assessment is focused on established standards for professionalism within the RBA region rather than retention of records by individual family forest owners. We conducted quantitative and qualitative assessments based on the less intensive forest management of FFOs and investigated qualifications and availability of credentials for forest professionals.

We also take into consideration that the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners.

ASSESSMENT OF COMPLIANCE:

As noted under Indicator 10.5.1, family forest owners typically do not maintain staff for the management of their forest lands. Instead, forest management professionals are hired as contractors on an "as needed" basis, and some landowners may choose to do some of the 'light duty' activities themselves. As such, family forest owners do not set forth competency and training requirements beyond commonly accepted industry standards, and therefore do not typically maintain records on qualifications for contracted professionals. It is, however, common practice for landowners to vet the qualifications of contracted professionals as a condition of hire. Our risk assessment is focused on established standards for professionalism within the RBA region.

Credentials for private and public service resource management professionals are available upon request. As an example, the Association of Consulting Foresters lists all members by state on their website, including education and years of experience. Professional foresters within the RBA region typically have achieved at minimum a B.S.

degree in forestry or a related field. Professional logger training programs in all three states maintain current records of all actively participating loggers. Certificates and training records are available from loggers upon request. Other resource management professionals providing services to family forest owners such as pesticide application and prescribed burning also carry corresponding licenses and/or related training credentials.

Based on the high level of competence reported under Indicator 10.5.1, and the ease of access to credentials for professional service providers, the risk of non-conformance to Indicator 10.5.2 is considered low.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 10.5.3 Safeguards and verification procedures are in place to ensure that contractors are qualified for the activities they conduct within the FMU.

INDICATOR 10.5.3 RISK RATING	Low
ALTERNATIVE MEANS OF VERIFICATION	Yes; refer to the Assessment Methodology section.
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
Because Indicator 10.5.3 applies specifically to the FMU level, the Indicator cannot be evaluated using a Risk Based Approach at a regional scale. Therefore, we propose using an alternative means of verification as described in the Verification Protocol. We apply the Indicator to all Category 2 lands collectively within the RBA region rather than to each individual FMU. Our risk assessment is focused on established standards for professionalism and common practice within the RBA region rather than FMU level actions performed by individual family forest owners. We consulted the NWOS results for landowner attitudes regarding stewardship values.   We researched the training and/or requirements of state and private foresters, loggers, and contractors within the RBA geography. We investigated the quantity of foresters, loggers, and contractors available within the RBA geography. Consult BMP implementation rates as a proxy for the competency of forest workers.

We also take into consideration that the VP specifically states that scale and intensity of forest management operations are relevant for evaluating compliance with Criteria 10.1, 10.2, 10.3 and 10.5 (Verification Protocol Chapter 6, page 24). As such, consistent with the VP guidance, we consider formal and informal components of planning and management systems to be credible options for family forest owners.

ASSESSMENT OF COMPLIANCE:
As noted under Indicators 10.5.1 and 10.5.2, well established industry standards for professionalism are in place for foresters, loggers, and other natural resource service providers within the RBA region.

Interviews with pellet producers within the RBA region indicate that meeting training requirements is obligatory for their suppliers. The high implementation rate of BMPs in all three states within the RBA region provides evidence that contractors are qualified and competent in providing professional services on family forest lands.

Additionally, university degrees are typically considered a minimum qualification of professional foresters employed within the region. Other professional services such as pesticide application and prescribed burning require state issued licenses or training certificates.

According to the NWOS, 69% of family forest owners representing 70% of family forest lands in the southeast rate protection of nature as important or very important. Similarly, landowners representing 75% of family forest lands indicate they have a strong emotional tie to their property. These landowner attitudes suggest there is a high likelihood that family forest owners in the RBA region practice vigilance in vetting the qualifications of contractors providing services on their property.

Indicator 10.5.3 is designated with a low-risk rating for non-compliance based on well-established standards of professionalism within the forestry sector, accessibility to landowners of professional qualifications, and landowner attitudes suggesting a high degree of motivation to practice due diligence when employing professionals on their forest lands.

DISCLAIMERS AND CONSIDERATIONS:

We are unable to provide data on BMP compliance specifically on Category 2 lands, however implementation is monitored across all ownership classes throughout the RBA, and it is reasonable to assume statewide compliance rates are indicative of Category 2 lands.

PRINCIPLE 11: FOREST MANAGEMENT BY A GROUP OR REGIONAL ASSOCIATION OFFERS SUFFICIENT SAFEGUARDS FOR SUSTAINABLE FOREST MANAGEMENT.

CRITERION 11.1 A group or regional association is led and supervised by an independent legal entity.

INDICATOR 11.1.1 The group or regional association shall be led and supervised by an independent legal entity or by a person acting as a legal entity.

INDICATOR 11.1.1 RISK RATING	N/A
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY:

We researched the level of participation in formal group certification by Category 2 landowners within the RBA region by consulting ATFS internal records, and records publicly available on the FSC Public Certificate Search website (info.fsc.org). We consulted the most current FIA data for data on forest area within the RBA. We also investigated applicable ATFS and FSC standards that establish rules for group certification, including the entities that manage the groups. We also consulted the ADBE Public Report on ATFS.

ASSESSMENT OF COMPLIANCE:

The majority of Category 2 landowners within the RBA region are not enrolled in a formal group or regional association organized for the purposes of coordinating or guiding forest management activities. The 3,108,483 acres of family forest land enrolled in the American Tree Farm System certification represents only 14% of the total area of family forest ownership within the RBA region. See Risk Assessment Table XII below. There are only four FSC group certificates in the RBA's geography. In total, these four certificates include 319 member properties, and 77,187 acres that qualify as Category 2 lands, which represents less than 1% of the family forest lands within the RBA. Consequently, for the most part, Principle 11 and associated Criteria and Indicators are not applicable to this RBA.

Risk Assessment Table XII: American Tree Farm System Certified Lands within the RBA Region.

STATE	ATFS Properties	ATFS Acres	Total Forested Acres	Total FFO Acres	ATFS % of Total Forested Acres	ATFS % of FFO Acres
Florida	1,103	697,921	14,510,351	3,056,917	5%	23%
Georgia	2,438	1,769,669	25,176,030	12,609,500	7%	14%
South Carolina	1,545	640,893	13,725,695	6,754,162	5%	9%
Total	**5,086**	**3,108,483**	**53,412,075**	**22,420,579**	**6%**	**14%**

Risk Assessment Table XIII: Forest Stewardship Council Category 2 Certified Lands within the RBA Region.

STATE	Total Forested Acres	Total FFO Acres	Total FSC Cat 2 Acres	FSC % of Total Cat 2
Florida	14,510,351	3,056,917	1,330	0%
Georgia	25,176,030	12,609,500	2,496	0.02%
South Carolina	13,725,695	6,754,162	72,724	1.08%
Total	**53,412,076**	**22,420,579**	**76,549**	**0.34%**

For the relatively small number of Category 2 landowners enrolled in formal groups, the group entities, and the group members (i.e., landowners) are held to standards maintained by the two primary established certification schemes: American Tree Farm System, and Forest Stewardship Council. ATFS includes in Administration section 1.1 the requirement that a group (IMG) must be a legal entity. The group individuals are managed by a group manager, who is part of and designated by this independent legal entity. Similarly, section 1.1 of the FSC Standard for Forest Management Group Entities (FSC STD 30 010) requires the group entity must be an independent legal entity or an individual acting as a legal entity. Both certification systems also require that group entities have a written commitment to sustainable forestry. All four FSC groups in the RBA region are led and supervised by independent businesses.

It is worth noting that in their assessment of both FSC and ATFS against the SDE+ Sustainable Forest Management requirements, the Dutch Commission on Sustainability of Biomass for Energy Applications (ADBE) concluded that the whole of Criterion 11.1 is fully addressed by the two certification systems.

For the remainder and majority of Category 2 lands, that are not participating in formal groups or associations, each landowner has the legal authority to make decisions on their own, acting in their own best interests, as outlined in the assessments for Principles 6 and 10. Family forest owners in the RBA region have access to a robust framework of public and private resources and programs to provide expertise in the form or various programs, tools and guidance which collectively serve to provide safeguards for sustainable forest management.

In summary, for the roughly 14% of Category 2 landowners enrolled in groups, on the basis of requirements of applicable certification schemes, the risk of non-compliance is low. For the remainder of Category 2 landowners who are not participating in groups, this indicator is not applicable.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 11.1.2 The entity shall meet all statutory requirements, such as registrations and the paying of taxes.

INDICATOR 11.1.2 RISK RATING	N/A
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
We researched the level of participation in formal group certification by Category 2 landowners within the RBA region by consulting ATFS internal records, and records publicly available on the FSC Public Certificate Search website (info.fsc.org). We consulted the most current FIA data for data on forest area within the RBA. We consulted the FSC US Controlled Wood National Risk Assessment, specifically with regard to Category 1, Applicable Laws and Regulations. We also investigated applicable ATFS and FSC standards that establish rules for group certification, including the entities that manage the groups. We also consulted the ADBE Public Reports on ATFS and FSC.

ASSESSMENT OF COMPLIANCE:

As noted above under Indicator 11.1.1, the majority (representing approximately 85% of the RBA family forest area) of Category 2 landowners within the RBA region are not enrolled in a formal group or regional association organized for the purposes of coordinating or guiding forest management activities. The cumulative area enrolled in ATFS and FSC group certificates represents approximately 14% of the family forest land in the RBA region.

For the relatively small number of Category 2 landowners enrolled in formal groups, the group entities, and the group members (i.e., landowners) are held to standards maintained by the two primary established certification schemes: American Tree Farm System, and Forest Stewardship Council. Section 1.2 of the FSC Standard for Forest Management Group Entities (FSC STD 30 010) requires the group entity to comply with relevant legal obligations, such as registration and payment of applicable fees and taxes. Section 1.1.b.iii of the ATFS IMG Standard requires group entities to adhere to ATFS standards, which in turn requires compliance with all applicable laws (Indicator 2.1.1). As noted above under Indicator 11.1.1, ADBE concluded that the whole of Criterion 11.1 is fully addressed by the ATFS and FSC certification systems.

For the remainder and majority of Category 2 lands that are not participating in formal groups or associations, each landowner has the legal authority to take decisions on their own, acting in their own best interests, as outlined in the assessments for Principles 6 and 10. All individuals and entities within the US are legally required to register with federal and state governments to file taxes. Failure to pay taxes can result in severe fines and penalties. As noted in the FSC US CW NRA, specifically for Indicators 1.1 and 1.7 addressing legal authority and payment of taxes, a robust legal framework maintained and enforced by state and federal governments provides a strong assurance that all laws are followed, including registration and licensing of legal entities, and payment of taxes. FSC provides a designation of low risk for legal compliance throughout the conterminous United States, including the entire RBA region.

The definition utilized by The World Bank, in their Worldwide Governance Indicators, Rule of Law is 'capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence'. The United States has a Rule of Law percentile of 89.42 percent as well as a Control of Corruption percentile of 88.46 percent by the World Bank. This conclusion further corroborates that systems are in place in the US, in which the geographic scope of the RBA sits, and they are largely ensured through rule of law.
In summary, for the roughly 14% of Category 2 landowners enrolled in groups, on the basis of requirements of applicable certification schemes, and the strong rule of law throughout the United States, the risk of non-compliance is low. For the remainder of Category 2 landowners who are not participating in groups, this indicator is not applicable.

DISCLAIMERS AND CONSIDERATIONS:

None

INDICATOR 11.1.3 The division of responsibility between the entity and the members of the group in relation to sustainable forest management and the requirements of this protocol has been clearly laid down.

INDICATOR 11.1.3 RISK RATING	N/A
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

We researched the level of participation in formal group certification by Category 2 landowners within the RBA region by consulting ATFS internal records, and records publicly available on the FSC Public Certificate Search website (info.fsc.org). We consulted the most current FIA data for data on forest area within the RBA. We also investigated applicable ATFS and FSC standards that establish rules for group certification, including the entities that manage the groups. We also consulted the ADBE Public Reports on ATFS and FSC.

ASSESSMENT OF COMPLIANCE:

As noted above under Indicator 11.1.1, the majority (representing approximately 85% of the RBA family forest area) of Category 2 landowners within the RBA region are not enrolled in a formal group or regional association organized for the purposes of coordinating or guiding forest management activities. The cumulative area enrolled in ATFS and FSC group certificates represents approximately 14% of the family forest land in the RBA region.

For the relatively small number of Category 2 landowners enrolled in formal groups, the group entities, and the group members (i.e., landowners) are held to standards maintained by the two primary established certification schemes: American Tree Farm System, and Forest Stewardship Council. ATFS requires roles and responsibilities of group entities and members to be clearly described and communicated according to Sections 1.1 and 1.2 of the ATFS IMG Standard. Section 2 of the FSC Standard for Forest Management Groups requires that a division of responsibilities between the entity and members must be clearly defined and documented.

It is also worth noting that in their assessment of both FSC and ATFS against the SDE+ Sustainable Forest Management requirements, the Dutch Commission on Sustainability of Biomass for Energy Applications (ADBE) concluded that the whole of Criterion 11.1 is fully addressed by the two certification systems.

For the remainder of Category 2 lands that are not participating in formal groups or associations, each landowner has the legal authority to take decisions on their own, acting in their own best interests.

Family forest owners in the RBA region have access to a robust framework of public and private resources and programs to provide expertise in the form or various programs, tools and guidance which collectively serve to provide safeguards for sustainable forest management. Further, it is common practice throughout the United States to enter into formal contracts or agreements whenever formal services are provided and particularly when commercial products are sold, as in the case of biomass to a pellet mill. As a rule, contracts are designed to clearly document responsibilities of each party to the contract. Sample contracts for some services are provided at no cost by state forestry agencies and other service organizations in this geography and readily available at their websites.

In summary, for the roughly 14% of Category 2 landowners enrolled in groups, on the basis of requirements of applicable certification schemes, the risk of non-compliance is low. For the remainder of Category 2 landowners who are not participating in groups, this indicator is not applicable.

DISCLAIMERS AND CONSIDERATIONS:

None

CRITERION 11.2 **A group or regional association shall meet the requirements for Sustainable Forest Management. The separate forest management activities of the individual members of the group or regional association shall also meet these requirements, if applicable for the management of the forest concerned.**

INDICATOR 11.2.1 The group or the regional association shall have procedures in place for the membership of the group, in which the requirements of this protocol have been incorporated in relation to the scale and complexity of the group, containing, for example:
- the organisational structure;
- the responsibilities of the entity and the members with corresponding activities;
- rules regarding membership of the group;
- rules regarding suspending or revoking membership;
- complaints procedures for group members;
- procedures for taking corrective measures following an internal request or a request from the Conformity Assessment Body, including deadlines and consequences if the measures are not complied with.

INDICATOR 11.2.1 RISK RATING	N/A
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY

We researched the level of participation in formal group certification by Category 2 landowners within the RBA region by consulting ATFS internal records, and records publicly available on the FSC Public Certificate Search website (info.fsc.org). We consulted the most current FIA data for data on forest area within the RBA. We also investigated applicable ATFS and FSC standards that establish rules for group certification, including the entities that manage the groups. We also consulted the ADBE Public Reports on ATFS and FSC.

ASSESSMENT OF COMPLIANCE:

As noted above under Indicator 11.1.1, the majority (representing approximately 85% of the RBA family forest area) of Category 2 landowners within the RBA region are not enrolled in a formal group or regional association organized for the purposes of coordinating or guiding forest management activities. The cumulative area enrolled in ATFS and FSC group certificates represents approximately 14% of the family forest land in the RBA region.

For the relatively small number of Category 2 landowners enrolled in formal groups, the group entities, and the group members (i.e., landowners) are held to standards maintained by the two primary established certification schemes: American Tree Farm System, and Forest Stewardship Council. ATFS requires roles and responsibilities

of group entities and members to be clearly described and communicated according to Sections 1.1 and 1.2 of the ATFS IMG Standard. In ATFS the group entity must have a written commitment to sustainable forestry and the group organization must adhere to ATFS eligibility requirements (section 1.1). The individual group members must meet the requirements of the ATFS standard. The group entity must ensure members have a written commitment to sustainable forestry and are notified to all requirements. Rules for membership, entry, exit, and suspension are addressed in sections 1.3, 1.4 and 2.3 of the IMG standard. Complaints procedures are addressed in section 1.5. The group organization must establish a monitoring system to monitor conformance with ATFS standards and take corrective actions as needed (sections 2.2, 3.1, 4.1). Similarly, all of these issues are addressed in section 3 of the FSC Standard for Forest Management Groups (FSC STD 30 010).

It is also worth noting that in their assessment of both FSC and ATFS against the SDE+ Sustainable Forest Management requirements, the Dutch Commission on Sustainability of Biomass for Energy Applications (ADBE) concluded that the whole of Criterion 11.2 is fully addressed by the two certification systems.

For the remainder and majority of Category 2 lands that are not participating in formal groups or associations, each landowner has the legal authority to take decisions on their own, acting in their own best interests, as outlined in assessments for Principles 6 and 10.

In summary, for the roughly 14% of Category 2 landowners enrolled in groups, on the basis of requirements of applicable certification schemes, the risk of non-compliance is low. For the remainder of Category 2 landowners who are not participating in groups, this indicator is not applicable.

DISCLAIMERS AND CONSIDERATIONS:
None

INDICATOR 11.2.2 The status of the FMUs in the relevant region shall be outlined in a forest management plan or a similar document.

INDICATOR 11.2.2 RISK RATING	N/A
ALTERNATIVE MEANS OF VERIFICATION	N/A
MITIGATION (IF NEEDED)	N/A

ASSESSMENT METHODOLOGY
We researched the level of participation in formal group certification by Category 2 landowners within the RBA region by consulting ATFS internal records, and records publicly available on the FSC Public Certificate Search website (info.fsc.org). We consulted the most current FIA data for data on forest area within the RBA. We also investigated applicable ATFS and FSC standards that establish rules for group certification, including the entities that manage the groups. We also consulted the ADBE Public Reports on ATFS and FSC.

ASSESSMENT OF COMPLIANCE:
As noted above under Indicator 11.1.1, the majority (representing approximately 85% of the RBA family forest area) of Category 2 landowners within the RBA region are not enrolled in a formal group or regional association

organized for the purposes of coordinating or guiding forest management activities. The cumulative area enrolled in ATFS and FSC group certificates represents approximately 14% of the family forest land in the RBA region.

For the relatively small number of Category 2 landowners enrolled in formal groups, the group entities, and the group members (i.e., landowners) are held to standards maintained by the two primary established certification schemes: American Tree Farm System, and Forest Stewardship Council. ATFS requires that landowners have and implement a management plan as stipulated in Performance Measure 1 and associated indicators. Similarly, FSC Principle 7 requires a documented management plan.

It is also worth noting that in their assessment of both FSC and ATFS against the SDE+ Sustainable Forest Management requirements, the Dutch Commission on Sustainability of Biomass for Energy Applications (ADBE) concluded that the whole of Criterion 11.2 is fully addressed by the two certification systems.

For the remainder and majority of Category 2 lands that are not participating in formal groups or associations, each landowner has the legal authority to take decisions on their own, acting in their own best interests.

In summary, for the roughly 14% of Category 2 landowners enrolled in groups, on the basis of requirements of applicable certification schemes, the risk of non-compliance is low. For the remainder of Category 2 landowners who are not participating in groups, this indicator is not applicable.

DISCLAIMERS AND CONSIDERATIONS:
None

RISK MITIGATION

RISK MITIGATION AND MEASURES

For sourcing regions in which a "specified risk" has been identified for a given sustainability criterion, mitigation measures must be implemented to reduce the risk level to "low." As a comprehensive assurance solution, the RBA identifies explicit mitigation measures for each criterion with specified risk.

This RBA identifies mitigation measures specifically designed to respond to the nature of the sustainability variable and related risk presented for a given criterion or indicator, as it applies to family-owned forests (Category 2). This ensures targeted and consistent mitigation efforts across pellet producers. Similarly, this also enables aligned monitoring and the ability to evaluate effectiveness over time, supporting the system's overall integrity in providing compliance with SDE+.

This approach draws on AFF's experience with risk mitigation as well as guidelines, approaches, and experiences associated with other systems, including Forest Stewardship Council (FSC) Controlled Wood and the Sustainable Biomass Program (SBP).

FAMILY WOODLAND SPECIFIC MITIGATION

Because this RBA is developed expressly for Category 2 lands, the identified mitigation measures reflect the following considerations:
1. The unique nature of Category 2 lands, including the size, scale, and intensity of their operations
2. Incorporation of research and documented best practice related to family landowners and their attitudes, preferences, and behavior to effectively lead to positive impact related to the identified risk
3. Feedback received from stakeholders with an identified interest in family ownerships

Identified mitigation measures include those implemented at different scales, including at the state level, wood sourcing basin level, and the site level. These different scales, working together, are essential to reducing the specified risk to low.

CALIBRATING THRESHOLDS FOR MITIGATION

To appropriately reduce the risk level from "specified" to "low," mitigation measures must be implemented at a level commensurate with the volume of pellets to be verified for SDE+ compliance for each producer. In a simplistic example, setting aside any potential economies of scale, a pellet producer seeking SDE+ compliance verification for 100,000 tons of pellets is affecting roughly twice the land area that they would if they are only seeking SDE+ compliance verification for 50,000 tons of pellets. As such, the producer would need to implement twice the amount of on the ground or land-based mitigation under the 100,000-ton scenario than the 50,000-ton scenario.

As such, the extent of mitigation measures to be applied by pellet producers in their supply basins must be specifically calibrated based on thorough and systematic documented analyses of the following factors for land-based specified risks:

- The volume of Category 2 pellets to be claimed for SDE+ compliance
- The extent (land area) of the specified risk within the geography of sourcing
- The extent (land area) of family woodlands (Category 2) in the geography of sourcing and within the geographic areas of specified risk, where identified
- Ratios of raw wood volume to harvested forest area, using appropriate silviculture to produce biomass for pellets, corroborated by scientific sources and/or experts
- Conversion rates of raw wood to shippable pellet volumes

The analysis of the variables above enables the estimation of land area likely affected to yield specified volumes and, thus, serves as a basis for determining how much mitigation is needed to effectively reduce the specified risk level to low for each verified volume.

The current risk assessment does not identify specified risks for operational criteria, the following factors would also serve as analytical inputs for calibrating the extent of mitigation for specified risks associated with operational indicators into the future:

- Total production capacity of the facility
- Maturity and demonstrated effectiveness of mitigating systems
- The portion of roundwood supplies purchased directly from Category 2 landowners as stumpage versus that which is acquired through the open market or as "gate wood"
- The number of competitors with overlapping sourcing basins that may affect specified risks
- Number of primary first-tier suppliers, including logging crews and wood dealers
- Number of employees

Calibration analyses must embrace a precautionary principle, deferring to more rather than less mitigation, where any shortage of information or data concerning the extent of impacts associated with a pellet producer's unique operations is known.

Pellet producers must provide evidence of their analyses, justifying the extent of mitigation activities, in conformance with the above guidelines to CABs.

AFF has developed algorithms for determining thresholds for mitigation based on the above factors and can provide this service in support of RBA implementation.

MITIGATION MEASURES FOR LAND-BASED SPECIFIED RISKS

The descriptions below provide a general overview of mitigation measures designed to respond to specified risks identified in the risk assessment. These measures are required, often in combination, to effectively reduce risk levels from specified to low, based on the SDE+ compliant Category 2 volume to be claimed. Additional descriptions of mitigation requirements are outlined for each specified risk within the Risk Assessment section.

1. **Landscape management plans (LMPs):** The SDE+ requirements include specifications for management plans, which can only be achieved using landscape management plans, given the costs and limitations of individual management plans, as well as their limited adoption by Category 2 family landowners in the United States. (See Annex IV for an overview of LMPs.) As such, all RBA users are reliant on the development, implementation, monitoring, maintenance, and improvement of LMPs. At the mill level, pellet producers must demonstrate that a Category 2 land area, commensurate with the production of the specified volume of pellets (see Calibrating Thresholds for Mitigation above), is newly enrolled for management under the LMP in the year the wood is harvested and related SDE+ conformity year statement timeframe. A pellet producer must maintain the previous year's LMP enrolled land base while adding new acres under LMP management in their current year for the duration of their use of the RBA and approved use of the VP under Dutch law. The pool of acres managed under the LMP must be maintained and verified in monitoring (outlined below). In the case that, though annual monitoring by AFF, it is observed that acres enrolled in a past year are removed from LMP, the pellet producer must recruit additional, new acres under LMP use to compensate.

   LMPs that comply with the SDE+ requirements for management plans were established (in Georgia and South Carolina) or augmented (Florida) in each of the states within the scope of this RBA over the course of 2020. RBA users must provide monetary support to AFF for LMP maintenance, including engagement and training amongst the broader community of foresters and technical service providers, necessary revisions, technological updates, and other critical activities.

   Unit of mitigation: Acre recruited and under management supported by LMP use within the sourcing region.

   Evidence provided by pellet producer:
   - Documentation of LMP establishment (2020)
   - Documentation of financial support to AFF for implementation and maintenance of LMPs applying to their roundwood sourcing area
   - Documentation (using standardized format and platform) of Category 2 acres recruited for management under LMP based on the calibration of required land area to produce claimed SDE+ volume per year, per Calibrating Thresholds for Mitigation section. Documentation includes landowner name, location of the property, number of acres recruited, and date of subscription to management under the LMP.
   - Documentation of aggregated, retained Category 2 acreage pool under LMP management, including newly recruited replacement acres, if there is attrition of Category 2 acres from LMP supported management.
   - Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

   Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating this mitigation measure's effectiveness. As such, RBA users must provide AFF with standardized documentation of LMP use within their roundwood sourcing regions and secure egress to landowners' properties for monitoring. Monitoring will include confirmation that forest management, as supported by the LMP, is continued. Though it is not required, this may occur with the greatest ease and lowest cost through the ATFS program for subpopulation sampling. RBA users must provide monetary support for this function to AFF and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

2. **Engagement of family landowners resulting in on-the-ground management activities:** Research suggests that family landowners undergo a journey, from the time they become aware of their potential agency to taking management action on their land. This is especially true for complex conservation actions such as improving high conservation values or the restoration of habitat for threatened species. As such, outreach and education activities, such as printing and distributing informational materials or holding a landowner workshop, which may serve as critical first steps, are not sufficient to ensure appropriate action is being taken around a specified risk during the timeframe of the conformity year statement. Similarly, thus far, certification systems have had trouble evaluating the effectiveness of these techniques. As a result, this RBA requires the acre protected, restored, conserved, or treated by family landowners on their Category 2 lands within the supply basin as the unit of mitigation for on-the-ground activities.

At the mill level, pellet producers must demonstrate that an appropriate Category 2 land area is being silviculturally treated specifically for the noted high conservation value (HCV), habitat area, or other land feature associated with the specified risk. The extent of the land area must be commensurate with the production of the specified volume of pellets, an assumed even distribution of harvesting activities across the supply basin, and analysis of the area of Category 2 lands within the area of specified risk (see Calibrating Thresholds for Mitigation above).

The specific activities implemented by Category 2 family landowners, their names (anonymized, where necessary to protect privacy), and the spatial location (anonymized, where necessary to protect privacy), including county, must be documented and reported to CABs performing verifications and to AFF to support overall RBA impact and effectiveness monitoring. Pellet producers may work with landowners directly to implement these measures or contract with third parties to support coordination of the implementation.

Unit of mitigation: Acre protected, restored, conserved, or treated by family landowners within the supply basin.

Evidence provided by pellet producer:
- Documentation (using standardized format and platform) of specific activities implemented by individual family landowners on Category 2 acres based on the calibration of required land area to produce claimed SDE+ volume per year, per Calibrating Thresholds for Mitigation section. Documentation includes landowner name and location of the property (anonymized, where necessary to protect privacy), the number of acres treated, and specific treatment activities.
- Documentation of annual monitoring conducted by AFF, along with documentation of financial support to AFF for monitoring services.

Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating this mitigation measure's effectiveness. As such, RBA users must provide AFF with standardized documentation of mitigation activities within their roundwood sourcing regions and secure egress to implementing Category 2 landowners' properties for monitoring. RBA users must provide monetary support for this function and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

3. **Pellet producer procedures and programs:** Some of the non-land based SDE+ criteria, such as those related to training or sourcing protocols, rely on the procuring pellet producer's programs and procedures. Any mitigation activities of this nature must be documented and reported to CABs performing verifications and AFF to support overall RBA impact and effectiveness monitoring.

Unit of mitigation: Varied.

Evidence provided by pellet producer:
- Documentation of company-specific policies or practices implemented.

Effectiveness evaluation: CBs is are responsible for evaluating the effectiveness of these mitigation measures, should they be required. Pellet producers are responsible for the reporting of evaluations of effectiveness conducted by their CABs in the form of complete audit reports.

EMERGENT MITIGATION NEEDS

In the event pellet producers and/or CABs identify evidence suggesting elevated systemic risk presence that is inconsistent with findings of this RBA's risk assessment, CABs and pellet producers are required to take the following actions:
- Develop mitigation measures specific to Category 2 family woodlands in the roundwood supply area, reflecting the three elements identified above (see Family Woodland Specific Mitigation) and implement according to the calibration guidelines identified above (see Calibrating Thresholds for Mitigation).
- Provide a report to AFF detailing the evidence and rationale for the determination of specified risk, along with a detailed report of the related mitigation measures.
- Monitoring and effectiveness evaluation: To ensure uniformity and consistent integration of feedback into the wider RBA, AFF is responsible for monitoring and evaluating any such mitigation measures' effectiveness. RBA users must provide monetary support for this function to AFF and provide related evidence to CABs. AFF will provide proof of monitoring to pellet producers as required evidence for verification audits.

RISK MITIGATION MONITORING

MONITORING OF RISK ASSESSMENT AND MITIGATION

Monitoring of the RBA and mitigation activities is essential for maintaining the system's integrity in providing assurance of compliance with SDE+ for Category 2 sourcing on family-owned woodlands in the geographic scope.

As the party responsible for the development and maintenance of the RBA, AFF is responsible for overall RBA monitoring and monitoring (validation) of mitigation activities and effectiveness, as a key facet of the system.

RBA MONITORING INCLUDES THE FOLLOWING MEASURES:

- Annual review of all risk designations in the RBA to determine if revised analyses are required, based on the availability of new data, availability of additional or alternative analytical methodologies, analysis of implemented mitigation (see below), and feedback from stakeholders, experts, and RBA users.
- Annual review of all mitigation measures identified in the RBA to determine if revised measures are required, based on the availability of new data, effectiveness assessment of implemented mitigation (see below), feedback from stakeholders, experts, and RBA users.
- Twice annual interviews with RBA users to gauge the effectiveness and generate insight into the RBA's improvement and identify needs for guidance and interpretation.
- Ongoing monitoring of family landowner activities via the American Tree Farm System (ATFS). Because the landowners most likely to harvest timber are also more likely to participate in landowner support programs, and there is a high adoption rate of ATFS amongst the general family landowner population with the geographic scope of the RBA, monitoring via the ATFS program provides a viable method when used in concert with the other methods identified above.
- Publication of a public monitoring summary and resulting revisions to the RBA.

In addition, AFF is responsible for monitoring and evaluating the effectiveness of mitigation. The monitoring of mitigation activities is central to the function of the RBA. The performance of mitigation activities is a key input into the monitoring of the RBA as a whole and must be consistently implemented and reported.

Monitoring of mitigation includes:

- Verification of mitigation actions on a sample of mitigation sites to verify activities was appropriately implemented.
- On-site effectiveness evaluation on a sample of mitigation sites to verify activities are effective in subsequent years.

Mode of Monitoring

Remote sensing, paired with documentation review or other evidence, may suffice for some mitigation activities, such as those implemented in response to the specified risk of conversion to nonforest use, under Criterion 7.3. In other cases, on-site monitoring to verify mitigation implementation and evaluate effectiveness is required for measures including silvicultural practices, such as activities to protect, enhance or restore high conservation values (HCVs), under Criterion 7.1.

Site Selection

Sites will be selected for monitoring using a stratified random sample. Stratifications will be informed by topography, size classes of sites, density of sites, and other factors. For example, the monitoring sample may be generated from the a square root of total number of sites within various stratifications. Coefficients may be applied to stratification subpopulation samples, where appropriate, in recognition of their presentation within the overall sample and ensure an appropriate and cost effective monitoring system.

Application of Monitoring Results

All observations and themes of monitoring serve as inputs to enhance the overall effectiveness of the RBA. Results of monitoring and effectiveness evaluations will serve as inputs into annual revision and update of the RBA, including adjusted risk analyses and specified mitigation measures.

Public Disclosure: Reporting Monitoring and Effectiveness Evaluation

AFF will publish a public summary report of its monitoring of the RBA overall as well as mitigation measures implemented. Summaries of adjustments to mitigation measures and risk analyses will also be published in conjunction with annual updates to the RBA.

NOTE: AFF's implementation of monitoring is contingent on monetary support for these functions. Without this support, AFF cannot implement these functions, jeopardizing the credibility of the RBA. Pellet producers must provide CABs with evidence of monetary support for monitoring of the RBA.

ANNEX I: RBA STAKEHOLDER QUESTIONNAIRE

The following questionnaire was distributed to approximately 23,400 individuals and organizations on May 14, 2020. Recipients were asked to provide responses by June 13, 2020, when the questionnaire was closed. A total of 303 responses were received.

Question Number	Questions	Issues/Response Options	Applicable SDE+ SFM Criteria
1	Please select the state(s) about which you would like to submit input. Check all that apply.	Florida	N/A
		Georgia	
		South Carolina	
		Other (please specify)	
2	Which stakeholder group best describes you? Select one.	Response	
		Other (please specify)	
3	Do you currently have, or have you ever had, any of the following relationships with a Biomass Producer? Check all that apply.	Current Employee/Contractor	
		Past Employee/Contractor	
		Involved in dispute with Biomass Producer	
		Have unique knowledge about potential high conservation values of supply basin	
		Use/used the supply basin for recreational activities	
		Own property near a Biomass Producer	
		Neither I nor my organization has ever had any relationships with a Biomass Producer.	
		Other (please specify)	
4	Please provide any additional comments about your relationship with the forest sector and/or the biomass sector.	Open-Ended Response	N/A
5	In what capacity are you familiar with the management of family and small-scale woodland ownerships?	Open-Ended Response	N/A
6	Biodiversity - Please rank the overall effectiveness of management practices undertaken by family forest landowners as a whole, in terms of conserving endangered plant and animal species and high conservation value areas.	Response	C7.1, C7.2
		Please explain your answer	

Question Number	Questions	Issues/Response Options	Applicable SDE+ SFM Criteria
7	Biodiversity - Please rank how adequately federal, state, and local governments, conservation organizations, consulting foresters, and other technical service providers support family forest landowners in meeting their management objectives	Response	P10
		Please explain your answer	
8	Non-Timber Forest Products - In your opinion, how well are non-timber forest products, including products from hunting and fishing, regulated, monitored, and controlled on family and small forestlands in the region?	Response	C7.5
		Please explain your answer	
9	Plantations - Please indicate your level of agreement/disagreement with the following statements related to plantation management on family and small forestlands (note: In this instance, plantation refers to forests that are either entirely or partially manually planted as opposed to naturally regenerated):	In the case of plantations, family and small landowners demonstrate a preference for native species.	C7.4
		A relevant percentage of the wood plantation area on family and small forestlands is able to revert to a natural forest at a later stage.	
		Please provide additional comments as necessary:	
10	Quality, Health, and Vitality of the Forest - Please indicate your level of agreement/disagreement with the following statements related to the use of Best Management Practices (BMPs) and other strategies for protection measures on small and family-owned woodlands.	Soil quality is maintained and, if necessary, improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes.	C8.1
		Water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) is maintained and where necessary improved.	C8.2
		Important ecological cycles are preserved, including carbon and nutrient cycles.	C8.3
		Unnecessary damage to ecosystems is prevented by applying BMPs and the most suitable road construction methods and techniques for local conditions.	C8.4
		If fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken.	C8.5
		Management is designed to prevent and control diseases and pests.	C8.6
		The use of chemicals is only permitted if alternatives prove insufficient.	C8.7
		Pesticides classified as type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted.	C8.7
		Waste and litter are prevented, or collected, stored, and disposed of responsibly.	C8.8
		Please provide additional comments as necessary:	N/A

Question Number	Questions	Issues/Response Options	Applicable SDE+ SFM Criteria
11	Production Capacity - Please indicate your level of agreement/disagreement regarding typical practices implemented on small and family forestlands to maintain productive capacity and for protection again illegal activities	The production capacity of all forest types represented in the forest management unit is maintained.	C9.1
		The forest management unit is sufficiently protected against all forms of illegal exploitation of timber and non-timber forest products, including hunting and fishing, the illegal establishment of settlements, illegal land use, illegally initiated fires, and any other illegal activities.	C9.1
		Please provide additional comments as necessary:	
12	Sustainable Forestry Management - Please indicate your level of agreement/disagreement regarding typical practices implemented on small and family forestlands to maintain productive capacity and for protection again illegal activities.	Forest management is designed to achieve the objectives of a forest management plan and covers inventory, analysis, planning, implementation, monitoring, and evaluation.	C10.1
		Essential elements for the management of the forest are indicated on maps.	C10.3
		The implementation of the forest management plan is periodically monitored, and the ecological effects of forest management are evaluated.	C10.4
		The forest management plan is implemented by professional office and field staff, whose expertise and knowledge are maintained by an effective and regular training program.	C10.5
		Please provide additional comments as necessary:	N/A
13	In your experience, which of the following components are typically included in forest management plans for small and family forestlands in the region? (select all that apply)	A description of the current condition of the forest	C10.2
		Long-term ecological goals	
		Annual allowable cut	
		Budget planning for the implementation of the forest management plan	
		Do not know	
		Please provide additional commentary as necessary:	
14	Please use the space below for any additional comments you would like to include:	Open-Ended Response	N/A

Question Number	Questions	Issues/Response Options	Applicable SDE+ SFM Criteria
15	Would you like follow-up contact to discuss your feedback?	Response	N/A
	If yes, please provide your contact information:	Name	
		Company	
		Address	
		Address 2	
		City/Town	
		State/Province	
		ZIP/Postal Code	
		Country	
		Email Address	
		Phone Number	
16	Do we have your permission to list your name and organization (if applicable) in our reporting as a stakeholder who provided feedback during the consultation process?	Response	N/A
17	Please provide recommendations for any other individuals or organizations that you think should be included in this consultation:	Open-Ended Response	N/A

ANNEX II: STAKEHOLDER CONSULTATION RESULTS AND SUMMARY

INTRODUCTION

In May 2020, the American Forest Foundation (AFF) developed and distributed a questionnaire to gather input from stakeholders as part of the development of a Risk-Based Approach (RBA) for achieving conformance with the Netherlands' SDE+ sustainability requirements for biomass. The RBA applies specifically to small and family-owned forest management units (500 hectares or smaller) in Georgia, South Carolina, and the northern third of Florida. The RBA may be used by biomass producers seeking verification or certification to SDE+ for applicable segments of their supply basins within this geography. Consultation with stakeholders and experts is a required and essential source of information for the development of the RBA's risk assessment. The consultation includes gathering the input of individuals or groups that have an interest in any decision or activity that may occur under the RBA (e.g., logging, forest management, conservation, etc.). Summary results of the questionnaire were considered in the risk assessment process and also served to inform further outreach efforts.

METHODOLOGY

The questionnaire was developed and administered by the AFF. It was distributed via email on May 14. The distribution included contact lists developed by AFF to support stakeholder consultation. An estimated 23.4K individuals and organizations were invited to respond to the questionnaire. A total of 303 responses were received. The questionnaire remained open for responses from May 14 through June 13 (a total of 30 days).

CONTENT

The questionnaire included a comprehensive set of questions concerning the Sustainable Forest Management (SFM) requirements of the SDE+ sustainability requirements for biomass. Questions posed to stakeholders directly addressed issues relating to criteria associated with SFM Principles 7, 8, 9 and 10 as stipulated in the Dutch Verification Protocol for Sustainable Solid Biomass for Energy Production (VP). See Annex I for the entire list of questions and the specific SFM criteria they address. The questionnaire also provided space for general comments and the collection of information about the respondents to support analysis.

RESULTS
General Information and Related Experience

Of the 303 respondents, 89 (29%) indicated that they would like to submit input specific to the geography of interest, namely Florida, Georgia, and/or South Carolina. The remaining respondents indicated states outside of these three, including other states in the Southeastern region, as well as states outside of the region.

The most commonly indicated stakeholder group for respondents was Landowner or Landowner Organization (60% of all respondents). Consulting foresters represented about 11% of respondents, and Natural Resource Professional and Public Agency represented about 5% of respondents, respectively. See Annex II Table I for a summary of respondent demographics.

Risk Assessment Annex II Table I: Questionnaire respondent summary demographics.

Stakeholder Classification	Respondents Interested in RBA Region		All Respondents	
	#	%	#	%
Academia/Research	2	2.2%	5	1.7%
Community Representative	2	2.2%	6	2%
Consulting Forester	10	11.2%	33	10.9%
Environmental Group	4	4.5%	4	1.3%
Forest Industry Employee	9	10.1%	22	7.3%
Hunting/Fishing Interest	0	0.0%	2	0.7%
Landowner Representative	46	51.7%	183	60.4%
Natural Resource Professional	6	6.7%	17	5.6%
Public Agency	6	6.7%	15	5%
Recreation Interest	0	0.0%	1	0.3%
Religious Group	0	0.0%	1	0.3%
Trade or Labor Organization	3	3.4%	5	1.7%
Other	1	1.1%	9	3%
SUM TOTAL	89	100%	303	100%

The majority of respondents (63%) indicated, "Neither I nor my organization has ever had any relationship with a Biomass Producer."   About 9% indicated they "Own property near a biomass producer." About 7% were reported in each of the following three categories: Current Employee/Contractor, Past Employee/Contractor, and "Have unique knowledge about potential high conservation values of supply basin." In further describing their relationship to biomass producers, many respondents indicated several decades of experience as landowners and/or foresters.

Biodiversity

Respondents were asked to rank "*the overall effectiveness of management practices undertaken by family forest owners as a whole, in terms of conserving endangered plant and animal species and high conservation areas*". The majority (74%) ranked the effectiveness as Somewhat Effective to Highly Effective. A small number (6%) indicated "Not Effective."

Respondents were also asked to rank "*how adequately federal, state, and local governments, conservation organizations, consulting foresters, and other technical service providers support family forest owners in meeting their management objectives*". A majority (81%) indicated Landowners are somewhat supported, or Landowners are well-supported. A small number (11%) indicated Landowner support is inadequate.

Non-Timber Forest Products

Respondents were asked "*how well are non-timber forest products, including products from hunting and fishing, regulated, monitored, and controlled on family and small forestlands in the region*"? Over one-third (35%) indicated that the systems of regulation and control are Well Developed or Very Well Developed. An additional 44% indicated "Adequate" or "Neutral."   A small number (11%) responded with "Inadequate."

Plantations

Two questions were asked in relation to plantations. For each question, respondents were asked to indicate their level of agreement/disagreement ranging from Strongly Disagree to Strongly Agree. The first statement asked, "*In the case of plantations, family and small landowners demonstrate a preference for native species*". In response to this question, the majority (64%) indicated Strongly Agree or Agree. A small number (10%) indicated Disagree or Strongly Disagree. The second statement was "*A relevant percentage of the wood plantation area on family and small forestlands is able to revert to a natural forest at a later stage*". A majority (52%) indicated Strongly Agree or Agree with this statement while a small number (16%) indicated Disagree or Strongly Disagree.

Quality, Health and Vitality of the Forest

Respondents were asked to indicate their level of agreement/disagreement with a number of statements related to the use of best management practices and other strategies for protection measures on small and family-owned woodlands Annex II Table II. The range of topics included soil quality, water resources, ecological cycles, damage prevention, use of fire, diseases and pests, chemical use, and littering.

Statement related to the use of Best Management Practices and protection measures	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Opinion
Soil quality is maintained and, if necessary, improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes.	1%	7%	9%	38%	**42%**	3%
Water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) is maintained and where necessary improved.	1%	3%	11%	40%	**41%**	4%
Important ecological cycles are preserved, including carbon and nutrient cycles.	3%	3%	17%	**39%**	33%	6%
Unnecessary damage to ecosystems is prevented by applying BMPs and the most suitable road construction methods and techniques for local conditions.	1%	2%	7%	39%	**49%**	3%
If fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken.	3%	4%	17%	28%	**37%**	11%
Management is designed to prevent and control diseases and pests.	2%	6%	14%	**40%**	36%	2%
The use of chemicals is only permitted if alternatives prove insufficient.	8%	24%	18%	**33%**	14%	3%
Pesticides classified as type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted.	2%	5%	24%	22%	18%	**29%**
Waste and litter are prevented, or collected, stored, and disposed of responsibly.	2%	7%	14%	**39%**	33%	6%

As shown in Annex II Table II, in nearly all instances, a majority of responses were Strongly Agree or Agree with the statements indicating the use of BMPs and other strategies to address each topic. In all instances, less than 10% of respondents Strongly Disagreed with each statement. In the case of the statements related to chemical use and pesticides the responses indicated that 32% of respondents Disagree or Strongly Disagree that "*use of chemicals is only permitted if alternatives prove insufficient*", compared to 47% that Agreed or Strongly Agreed. The remaining 21% were neutral or had no opinion. When responding to the statement "*Pesticides classified as Type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted*", 40% Agreed or Strongly Agreed; slightly less than the 47% affirmative response to the previous question. In stark contrast however, only 7% Disagreed or Strongly Disagreed, while the majority - 52% - were neutral or had no opinion. Nearly one-third (29%) of respondents did not reply to these questions relating to pesticide use. These responses likely reflect a lack of understanding of the specific classification of pesticides by some of the stakeholders and

the use of chemicals as the most effective treatment (i.e., well-established and recommended practice) in some management situations, including during the establishment phase after replanting. While the sum of affirmative responses (Agree plus Strongly Agree) is relatively low for these two questions (47% and 40% respectively) when compared to other issues in the questionnaire, when focusing only on respondents that expressed an opinion, we find 60% Agree or strongly agree that "*use of chemicals is only permitted if alternatives prove insufficient*", and 84% Agree or Strongly Agree that "*Pesticides classified as Type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted*". Even so, because these survey results were mixed and suggested a potential lack of understanding around pesticide usage among family forest owners, we were led to consult with regional experts during the risk assessment process to get a better sense of how and when chemicals are applied on family forest lands.

Production Capacity

Respondents were asked to indicate their level of agreement or disagreement regarding typical practices implemented on small and family forestlands to maintain productivity capacity and for protection against illegal activities. In both instances, approximately 70% of responses indicated Agree or Strongly Agree that production capacity is maintained, and forest management units are protected from exploitation and illegal activities (Annex II Table III).

Risk Assessment Annex II Table III Responses Addressing Production Capacity

Statement related to production capacity	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Opinion
The production capacity of all forest types represented in the forest management unit is maintained.	2%	9%	15%	**46%**	24%	4%
The forest management unit is sufficiently protected against all forms of illegal exploitation of timber and non-timber forest products, including hunting and fishing, the illegal establishment of settlements, illegal land use, illegally initiated fires, and any other illegal activities.	3%	11%	15%	**42%**	27%	2%

Sustainable Forestry Management

Respondents were asked to indicate their level of agreement or disagreement with statements related to sustainable forest management, including plan development and implementation. In all instances, the majority of respondents indicated they Agree or Strongly Agree that sustainable forest management practices are applied (Annex II Table IV).

Statement related to sustainable forestry management	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	No Opinion
Forest management is designed to achieve the objectives of a forest management plan and covers inventory, analysis, planning, implementation, monitoring, and evaluation.	1%	4%	7%	39%	**46%**	2%
Essential elements for the management of the forest are indicated on maps.	2%	6%	11%	**43%**	33%	6%
The implementation of the forest management plan is periodically monitored, and the ecological effects of forest management are evaluated.	2%	6%	15%	**43%**	31%	2%
The forest management plan is implemented by professional office and field staff, whose expertise and knowledge are maintained by an effective and regular training program.	3%	9%	17%	**34%**	**34%**	4%

Respondents were also asked about the components that are typically included in forest management plans for small and family forestlands in the region. For those that provided a response to the question, "In your experience, which of the following components are typically included in forest management plans for small and family forestlands in the region?", a majority of respondents indicate that plans typically include a description of the current condition of the forest (93%) and long-term ecological goals (71%). Fewer respondents indicated that plans are likely to include budget planning for implementation (37%) or an annual allowable cut (31%). Slightly more than one-third (35%) of respondents either left all applicable fields blank or responded they do not know which of the listed components are typically included in forest management plans. For small and family forestlands, it is not common practice to calculate an annual allowable cut because it is unlikely that forests of this size will engage in annual or high-frequency harvesting activities. It is also uncommon to include detailed budget information in forest management plans for small and family forestlands because the forest management is not generally a commercial business operation. It is more common for plans to include an overall schedule of activities to indicate what will occur on an annual basis throughout the life of the plan (i.e., planting, timber stand improvement, prescribed fire, site prep, harvesting, etc.). Detailed budgets are more commonly developed as part of specific activity plans (i.e., cost-share applications or contracted services).

REVIEW OF RESPONSES FROM STAKEHOLDERS INTERESTED IN THE RBA REGION

The questionnaire invited respondents to indicate whether they had a specific interest in one or more of the three states include in the RBA regions (South Caroline, Georgia, Florida) which allows us to aggregate those responses specific to the geography of interest. A total of 89 respondents indicated they were interested in all or a portion of the RBA region.

In reviewing the responses from stakeholders expressing interest in one or more of the three states in the RBA region, there were minor differences from the overall responses. The largest group of responses was Landowner or Landowner Organizations (52%) followed by Consulting Foresters (11%), Forest Industry Employee (10%), Natural Resource Professional (7%), and Public Agency (7%). About 5% of respondents were Environmental Organizations.

With respect to the respondent's relationship to a biomass producer, the largest group (48%) indicated no prior relationship with a biomass producer. About 19% were Current or Past Employees/Contractors of a biomass producer, 10% own property within a biomass producer's supply basin and 9% "Have unique knowledge about potential high conservation values of supply basin."

A strong majority of respondents (81%) indicated biodiversity management practices are Highly Effective or Somewhat Effective, and an even greater percentage (89%) indicated Landowners are well-supported or Landowners are somewhat supported in meeting their management objectives. Only 5% indicated biodiversity management practices are Not Effective or that Landowner support is inadequate. About 7% responded that Non-Timber Forest Products are inadequately regulated, while 42% indicated these controls are Well Developed or Very Well Developed. In regard to plantations, the majority (69%) Agree or Strongly Agree that landowners prefer native species, and 54% Agree or Strongly Agree that areas are able to revert to a natural forest at a later stage.

As was reported in the general responses, stakeholders were also asked about the components that are typically included in forest management plans for small and family forestlands in the region. For those that provided a response to the question, "In your experience, which of the following components are typically included in forest management plans for small and family forestlands in the region?", a majority of respondents indicate that plans typically include a description of the current condition of the forest (95%) and long-term ecological goals (63%). Fewer respondents indicated that plans are likely to include budget planning for implementation (45%) or an annual allowable cut (36%). Slightly less than one-third (30%) of respondents either left all applicable fields blank or responded they do not know which of the listed components are typically included in forest management plans.

The following tables compare the results for respondents indicating interest in the RBA region with the general respondents for the specific statements that were included in the questionnaire (Annex II Tables V, VI, VII).

Annex II Table V: Responses Addressing Quality, Health, and Vitality of the Forest

Statement related to the use of Best Management Practices and protection measures	Respondents Indicating Agree or Strongly Agree	
	RBA Region (FL, GS, SC)	All Respondents
Soil quality is maintained and, if necessary, improved, with special attention to coasts, riverbanks, erosion-sensitive areas, and sloping landscapes.	87%	80%
Water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) is maintained and where necessary improved.	85%	81%
Important ecological cycles are preserved, including carbon and nutrient cycles.	74%	72%
Unnecessary damage to ecosystems is prevented by applying BMPs and the most suitable road construction methods and techniques for local conditions.	93%	88%
If fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken.	87%	65%
Management is designed to prevent and control diseases and pests.	84%	76%
The use of chemicals is only permitted if alternatives prove insufficient.	43%	47%
Pesticides classified as type 1A and 1B by the World Health Organization and chlorinated hydrocarbons are not permitted.	44%	40%
Waste and litter are prevented, or collected, stored, and disposed of responsibly.	75%	72%

Annex II Table VI: Responses Addressing Production Capacity

Statement related to production capacity	Respondents Indicating Agree or Strongly Agree	
	RBA Region (FL, GS, SC)	All Respondents
The production capacity of all forest types represented in the forest management unit is maintained.	71%	70%
The forest management unit is sufficiently protected against all forms of illegal exploitation of timber and non-timber forest products, including hunting and fishing, the illegal establishment of settlements, illegal land use, illegally initiated fires, and any other illegal activities.	77%	69%

Statement related to sustainable forestry management	Respondents Indicating Agree or Strongly Agree	
	RBA Region (FL, GS, SC)	All Respondents
Forest management is designed to achieve the objectives of a forest management plan and covers inventory, analysis, planning, implementation, monitoring, and evaluation.	90%	85%
Essential elements for the management of the forest are indicated on maps.	81%	76%
The implementation of the forest management plan is periodically monitored, and the ecological effects of forest management are evaluated.	74%	74%
The forest management plan is implemented by professional office and field staff, whose expertise and knowledge are maintained by an effective and regular training program.	74%	68%

CONCLUSION

As is shown in the aggregated responses as well as the states within the RBA region, there is strong agreement that important elements of sustainable forest management are sufficiently addressed on family and small forestlands. One of the regional differences that is noteworthy for the states in the RBA Region is the higher agreement with the appropriate use of fire (Table 4). The use of prescribed fire (controlled burns) is a more common practice in the Southeastern region, including the use of fire to restore important ecological conditions and cover types like longleaf pine.

Although the results of the questionnaire can be interpreted as supporting a determination of low risk for the majority of the identified concerns, it is also important to note opportunities for improvement. As such, in its work, the RBA development team was attentive to focal areas such as related to harvest rates and the use of chemicals and restrictions associated with specific categories of pesticides. The strong representation of Landowner and Landowner Organizations in the questionnaire responses is an important indication of the level of engagement from these stakeholders in issues and opportunities related to sustainable forest management. Even though the majority of respondents did not have an existing relationship with a biomass producer, there is a strong interest in the development of the forest sector and the practice of forestry on family and small woodlands within this stakeholder group.

ANNEX III: RBA TEAM BIOGRAPHIES AND CONTRIBUTING ORGANIZATION DESCRIPTIONS

American Forest Foundation Team

The American Forest Foundation (AFF) is a national conservation non-profit that focuses on private and family-owned U.S. forests. Through its partnerships and landowner outreach, it helps protect and improve watersheds, wildlife habitat, carbon storage, and sustainable wood supplies that come from these lands. AFF partners with organizations who use, or place a high value on forests for their business, to deliver measurable positive conservation impact and multiple sustainability assurance solutions. AFF leverages its expertise of family forest owner needs, its vast network of conservation partners, and its ability to develop innovative approaches to help companies meet their environmental and sustainability goals while at the same time providing support to family forest owners in caring for their land.

Sarah Crow, Senior Director, Sustainability Assurance, PROJECT LEAD

Sarah Crow is the Senior Director, Sustainability Assurance at the American Forest Foundation (AFF). She has a demonstrated track record in the sustainability, forestry, and conservation communities. With extensive experience at the state, national and international levels, Sarah has more than ten years of experience in technical strategy development and program management with an extensive network and proven ability to build successful partnerships with smallholders, NGOs, brands, forest product companies, government, trade organizations, and others. She works to build partnerships across sectors and geographies and has served on several committees related to market verification and smallholder engagement. Sarah was a Fulbright Scholar to Ukraine and holds a B.S. in Forestry from the University of Montana and an M.S. in Natural Resources from the University of Vermont.

Samantha (Sam) Delfing, Sustainability Assurance Manager

Sam is a forestry and natural resources professional with experience working in consulting forestry, large-scale industrial forestry, and conservation forestry-based in watershed restoration. She joined the American Forest Foundation in 2019 as the Southern Region Manager and now serves as Sustainability Assurance Manager. Prior to her move to AFF, Sam worked as a Conservation Forester for the Jefferson Conservation District, an affiliate of the USDA Natural Resources Conservation Service in Lakewood, CO. She worked with landowners to implement forest conservation and restoration projects on their land. Sam holds a B.S. in Environment and Natural Resources from Ohio State University and an M.S. in Forest Resources Management from State University of New York College of Environmental Science and Forestry. She lives in New Orleans, LA.

Maria Swindells, GIS Lead

Maria Swindells joined the staff at AFF in the Fall of 2018 as the GIS Manager. Maria has a BSc and Post-grad Geomatics diploma specializing in Remote Sensing and GIS, with a background in mapping technology development. She is the GIS lead for Woodscamp technologies and development. She serves as the GIS expert at AFF, developing GIS Strategies, managing GIS consultants, supporting GIS-enabled staff as new challenges arise, improving overall GIS process and access, and directly conducting GIS analyses.

Dave Bubser, Consultant

Dave Bubser has nearly two decades of experience in the sustainability assurance sector, including forest certification, supply chains, timber legality, biomass, climate and carbon offsets, environmental assessment, risk assessment, standard development, stakeholder consultation, and crisis management. Dave is currently a Principal at Cambium Consulting. Previously he served as Vice President, Natural Resources Division at SCS Global Services, where he was responsible for international business for the forestry, chain of custody, carbon, fisheries, and seafood programs. Prior to joining SCS, Dave spent 17 years with the Rainforest Alliance, where he held several leadership positions, ultimately responsible for all certification and assurance activities in the U.S. and Canada and global carbon verification services. Before entering the forest certification sector, Dave spent over 15 years in various forest management positions in the Lake States and Inland Northwest regions of the United States, primarily in timber sales and forest development.

Greg Pate, Consultant

Greg Pate is the owner of Four W Forestry Group based out of Wetumpka, Alabama. A graduate of Auburn University with a B.S. In Forest Management, Mr. Pate has a distinguished career in forestry spanning 36 years. Following graduation, Mr. Pate contracted with private sector entities prior to operating Owl Creek Forestry, a consulting forestry firm, for two years before beginning a long career with the North Carolina Forest Service (NCFS). Mr. Pate was appointed as the 9th State Forester for North Carolina in 2012. Mr. Pate retired from the NCFS in 2014 and was appointed by Governor Robert Bentley as the 10th State Forester of Alabama. Mr. Pate left the Alabama Forestry Commission to begin his consulting group in 2016. He currently works for non-government organizations (NGOs), philanthropic trusts, and government agencies.

Elizabeth Woodworth, Consultant

Elizabeth Woodworth founded Wood & Co in 2016 after more than 20 years working in marketing and communications. During her career, Elizabeth has held positions in both for-profit and non-profit organizations. Her roles have included executive roles in marketing, communications, and sustainability. Elizabeth served on the European Biomass Association (AEBIOM) Board from 2012-2014 and currently serves on the Board of Trustees for the Institute for American Universities (IAU), a non-profit educational institution based in France. She received the 2014 Argus Biomass Award for Sustainability. Elizabeth received a B.A. in international studies and French from the University of Richmond, an MBA from The Wharton School, and an M.A. in international studies from the University of Pennsylvania. She lives in the Washington DC metropolitan area with her family.

External Reviewers

To complement the expertise and skillset of AFF's team in support of the RBA development and further promote the RBA's integrity, AFF contracted with several external organizations with specific subject matter expertise to provide both specific section and full scope reviews of the RBA. In addition to public and expert consultation, this process was designed to identify any areas for improvement, potential vulnerabilities to address, and to serve as a pre-test of the RBA's technical content. The following firms and individuals provided review.

SCS Global Services

SCS Global Services (SCS) provides services worldwide, working in the natural resources, built environment, consumer products, and climate sectors. Partnering with companies, government agencies, NGOs, and stakeholders, SCS strives to advance sustainable development goals through independent assessment, the application of sound science, and innovative solutions. Through these services, SCS Global is enabling decision-makers and purchasers to make informed decisions, giving innovators a competitive edge, and driving the development of leadership standards to create a framework for continuous improvement.

SCS Global provided a full scope external review of the RBA.

Ciara McCarthy

Ciara McCarthy holds a BSc (Hons) Agroforestry from the University of Wales, UK, and Oregon State University. She has accumulated over 17 years of experience working in operational forestry in the UK, Ireland, Australia, and the United States. Ciara is a Senior Lead auditor for FSC Chain of Custody, a lead auditor for FSC Forest Management Certification, and the Sustainable Biomass Program. She has completed audits in Oregon, Washington, California, Georgia, North Carolina, Virginia, Arkansas, British Columbia and New Brunswick, Canada, Latvia, North-Eastern Europe, Malaysia, and Japan. Ciara is a staff member of SCS Global Services as a Senior Lead Auditor, Technical Specialist, and FSC Controlled Wood Program Manager.

Sebastian Häfele

Sebastian Häfele has a master's degree in Environmental sciences and previous experience in life-cycle assessment of bioenergy and biomaterials. He has been working and auditing for SCS since 2016 and is a Senior Lead Auditor for FSC, PEFC, and SFI Chain-of-Custody and SBP and has conducted audits in California, the Southeastern US, Germany, and Latvia. Sebastian is a Technical Specialist at SCS and SBP Program Specialist and representing SCS at SBP CAB meetings and stakeholder advisory group.

NatureServe

NatureServe is a non-profit organization made up of passionate biodiversity scientists who want to apply the best information to decision-making. Change is made one decision at a time. And every good decision starts with good information. We want to make it possible—and easy—for people to use accurate, current scientific information as the basis for their conservation decisions and subsequent actions. The NatureServe Network empowers people to sustain biodiversity by ensuring everyone has access to the knowledge they need to be better stewards of our shared lands and waters. We serve as an authoritative source of comprehensive, decision-quality biodiversity data. NatureServe provides scientific knowledge that supports informed decisions. Together, with our network of

over 100 programs, we collect decision-quality data about imperiled species and entire ecosystems, transform that data into knowledge products and visualizations, and provide meaning through expert analyses and support to guide decision-making, implement action, and enhance conservation outcomes.

NatureServe provided a technical expert review of risk analyses related to species and ecosystems.

Patrick Comer, Chief Ecologist

Patrick Comer directs the Ecology Department at NatureServe from the Boulder, Colorado office. For over 30 years, his applied research has focused on ecosystem classification, spatial modeling, ecological assessment, and systematic planning support for conserving biodiversity and sustainable development. Pat was trained at the University of Michigan, Ann Arbor, in Forest and Landscape Ecology. He served in the Peace Corps in Costa Rica, working in agroforestry with rural cooperatives. In 1990, after returning to the United States, he worked as Ecologist in the Michigan Natural Features Inventory – formerly a part of The Nature Conservancy (TNC). In 1998, Pat moved west and served as Senior Regional Ecologist for TNC. By 2002, Pat moved from TNC to NatureServe and was appointed Chief Terrestrial Ecologist in 2003. He continues his work to advance ecosystem assessment methods with the public agencies and the private sector in projects across the Americas and beyond. Pat is currently advancing methods to assess ecosystems and landscapes' climate change vulnerability to identify effective, ecosystem-based adaptation strategies.

Peterson

Peterson is a Netherlands based consulting firm. Their in-depth knowledge and experience cover all aspects of the supply chain in many industries, including agriculture, energy, forestry, sustainability, and textiles. Peterson provided a full scope external review of the RBA but did not provide pre-verification or verification third-party auditing services.

Southern Forestry Consultants (SFC)

As a leading forestry and land management company in the Southeast United States, Southern Forestry Consultants is uniquely qualified to assist clients in implementing sustainable forestry and land management strategies across an array of landscapes. Major areas of emphasis include forest inventory, appraisal, auditing, quantitative and qualitative species monitoring and inventory, reforestation and regeneration, harvest planning and oversight, ecological enhancement and restoration, forest management planning and implementation, environmental resource issues management, environmental auditing, BMP compliance, prescribed burning, recreation management, native warm-season grass establishment, and management, natural resource management plan development focused on biodiversity and conservation objectives, and invasive species inventory and management.

SFC provided review RBA elements related to the development of landscape management plans (LMPs) and led revision and development of LMPs, a core mitigation strategy in the RBA.

ANNEX IV: LANDSCAPE MANAGEMENT PLANS IN THE SOUTHERN UNITED STATES

The Landscape Management Plan (LMP) is a vital tool deployed as mitigation under this RBA to address process and documentation requirements under the SDE+ criteria.

LMPs are designed to reduce barriers to family forest owner engagement and enhance access to traditional landowner assistance programs (such as forest certification, cost-share, and technical assistance programs). Management plans have long been a primary requirement for participation in these programs, which provide crucial support to landowners in managing their land. However, only 14% of family ownerships have management plans, and those with plans tend to have larger acreage holdings (often larger than 100 acres) and are already receiving assistance. The complexity and expense of developing a traditional, individual forest management plan reduce landowner engagement and can reduce the rate of certification of family-owned forests (Wells, 2020). Limitations on forester capacity to write these plans, which typically takes weeks or months, further prevent landowners in need of assistance from gaining access to assistance programs.

AFF and its partners recognize that overcoming this barrier is necessary to reaching conservation outcomes at a landscape scale, as 84% of family forest ownerships in the South are less than 100 acres (Butler, 2018). Ultimately, LMPs are an alternate planning framework that would more effectively support landowners in taking conservation action by removing these barriers. LMPs are rigorously created with input from various stakeholders, trained professionals, and scientists, and undergo multiple review processes, including third-party auditing, to ensure credibility and alignment with the ATFS Standards.

LMPs provide an overarching, landscape-level strategy and a silvicultural framework to support the implementation of professionally guided management actions at the FMU level, based on each landowner's distinct, personal objectives. While the LMP helps to support achieving landscape-scale conservation goals, it allows for independent and site-specific management approaches at a finer scale. Pellet producers are responsible for expanding the implementation of LMPs to family forest owners that supply them in their fiber supply basin. AFF/ATFS and partners are leading the development of LMPs across the country, with initial pilot LMPs developed in the Florida panhandle in 2017 and northern Alabama in 2018. As of January 2021, state-wide LMPs are in place for the geographic scope of this RBA in Florida, Georgia, South Carolina, as well as in Alabama, Arkansas, Louisiana, Virgina and Tennessee. Additionally, state-wide LMPs are slated for development in North Carolina and Mississippi in 2021 or 2022. Through the ATFS monitoring protocol and AFF's dedication to monitoring, evaluation, and research, we will continue improving LMP design and implementation and incorporating our learnings as we move forward (Wells, 2020). Some early successes include:

- 130% increase in new certified Tree Farms in Alabama, and an over 80% increase in Florida.
- The time to certify a landowner in these states has decreased from 1-2 months to 1-2 weeks.

Although an LMP is designed to replace the need for a traditional individual management plan, it does not replace professional foresters' valuable contributions. In fact, by reducing the time spent on creating lengthy individual-level management plans, LMPs return the focus to building the relationships between foresters and

landowners. After connecting with a forester, the landowner and forester evaluate the property together, assess the forest condition, and gain an understanding of the landowner's objectives and goals for the property. The forester would then use the LMP as a reference in the advice he or she provides to the landowner and continue to provide guidance in stewardship activities and management (Wells, 2020). As previously noted, most family forest landowners do not have a traditional forest management plan. Attempting to get individual, traditional forest management plans completed for the majority of landowners would require an unrealistic time scale that far exceeds the timeframe of current conservation initiatives and would fail to meet the immediate needs of landowners. The LMP is, therefore, a powerful and necessary tool to achieve conservation impact. In the context of this Risk-Based Approach, the LMP is a tool for mitigation where the risk under certain criteria may be above the "low" threshold. The LMP is a landscape-wide document providing silvicultural guidance and setting standards in Best Management Practices, as well as highlighting certain regulations. As such, LMPs generally address all of the SDE+ principles in some way. Additionally, AFF/ATFS has worked directly with partners to ensure the LMPs in this geographic scope contain elements that directly support each criterion's needs, wherever possible.

LMPs approach forest planning from the landscape level, considering the entire forest ecosystem and prioritizing conservation needs across a region. This helps pull together many family landowners' efforts towards a larger conservation goal that can have an even greater impact on the region while still enabling the landowner to achieve his or her personal objectives. AFF and partners believe this is critical to achieving conservation impact at a landscape scale (Wells, 2020).

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2016 NWOS Butler Brett J, Hewes J.H., Dickinson B.J., Andrejczyk K, Butler S.M., Markowski-Lindsay M (2016) Family forest ownerships of the United States, 2013: findings from the USDA Forest Service's national woodland owner survey. J For 114(6):638–647

Wells, A. 22 May 2020. LMPs driving management and impact on FFO lands [Memorandum]. American Tree Farm System. (Email)

ANNEX V: BEST MANAGEMENT PRACTICE OVERVIEW

Forestry BMPs in the United States, including the States of Florida, Georgia, and South Carolina

The passage of the landmark US Federal Water Pollution Control Act of 1972, commonly referred to as the Clean Water Act (CWA), establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. This includes requirements to address both point pollution from an identified outlet, and non-point pollution, where the source is not easily identified. Section 208 of the CWA defines timber harvesting and silvicultural operations as non-point pollution.

The US Environmental Protection Agency administers and enforces this law. The EPA requires states to develop regulatory programs for forestry to meet water quality requirements under the CWA. In 1987, the US Congress amended the CWA to include in Section 319, funding states to develop and manage non-point pollution programs. As a part of the overall non-point source pollution program in each state, environmental regulatory agencies such as the Florida Department of Environmental Protection, the Georgia Environmental Protection Division, and the South Carolina Department of Health and Environmental Control, delegated the authority and partially funded state forestry agencies including the Florida Forest Service, the Georgia Forestry Commission, and the South Carolina Forestry Commission, to develop, implement, and monitor a non-point source pollution program for forestry activities.

Through a process of stakeholder engagement and expert review, in all but one state (Arizona) nationally and in each of the states in the scope of this RBA, Forestry Best Management Practices (BMPs) were developed. Though specific BMPs differ by state, the general categories of timber harvest, streamside management zones (SMZ), stream crossings, forest road construction and maintenance, site preparation and reforestation, prescribed burning, pesticides and fertilizers, and waste disposal are addressed in most state's manuals, including the states within the geography of this RBA.

In the National Association of State Forester's (NASF) 2019 BMP monitoring report, State forestry agency BMP programs are categorized into four groups:

Regulatory— In regulatory states, BMPs are prescribed and required by law to be implemented. Typically, state law dictates that BMPs shall be used, and state regulations describe the required BMPs in detail. There are 13 states that implement BMP programs in this manner.

Quasi-regulatory — Some state BMP programs are identified as quasi-regulatory. In these states, state law establishes standards for water quality that silvicultural activities must meet but does not stipulate how the operator is to meet those standards. BMPs are recommended as a means to meet these standards. Eleven states fall into this category. Within the RBA geography, Florida and Georgia are in this category.

Some local government regulation — This category includes states that do not require BMPs at the state-level but allow local governments to require them. Five states operate in this manner.

Non-regulatory (Voluntary) — Some states implement their BMP program through information and educational efforts and rely on voluntary compliance. These states' BMP programs are nearly as successful as regulatory BMP programs. Twenty-one states use this approach. Within the RBA geography, South Carolina falls into this category.

Regardless of their category, Forestry BMP programs across the United States share at least two important similarities:

1. The programs are successful in controlling non-point source pollution from forestry activities. Overall implementation rates in the latest NASF Report (2019) show, where measured, the overall implementation rate is 94.95% for regulatory states, 93.82% for non-regulatory (voluntary) states, 90.58% for quasi-regulatory states, and 89.39% where some local governments regulate. Within the RBA geography, the quasi-regulatory states of Florida and Georgia post overall implementation rates of 99.81% and 94.37%, respectively. In comparison, the non-regulatory (voluntary) BMPs in South Carolina have an overall implementation rate of 88.93%. The effectiveness of BMPs are well documented and widely accepted, nationally and in the US South. The proper use of forestry BMPs has been reported to improve water quality 80-90% above prior practices as well as reducing the deposition of sediment, nutrients, and organic matter. (Walbridge, 1993)
2. Each state can stop and/or regulate forestry operations that create non-point source pollution, potentially damaging water resources. Within the RBA geography:

    Florida's BMP manual states, "The BMPs in this Manual are intended for implementation on all silviculture operations regardless of whether or not the operation is subject to other regulatory standards or permits. Anyone who desires to conduct silviculture activities that are not in compliance with this Manual must necessarily seek and obtain a permit from the appropriate local, state, and/or federal government agency prior to conducting the operation. In addition, the maintenance of State water quality standards is required during all silviculture operations".

    Georgia's BMP manual reads, "Failure to follow BMPs may result in civil and criminal fines and penalties…. Therefore, to prevent any potential water quality problems, it is in the best interest of everyone involved in silvicultural operations to properly plan and supervise their operations. By consistently following BMPs, problems can be avoided or corrected as soon as possible".

    South Carolina's, categorized as a non-regulatory (voluntary) program, BMP manual states, "Most of the BMPs in this manual address the protection of water quality or the requirements of Section 404 (dredge and fill) of the Clean Water Act…. The concept of BMPs was first introduced in response to federal legislation, the Clean Water Act, as a practical and effective means to reduce non-point source (NPS) pollution. Compliance with BMPs is required for forestry activities that involve the discharge of dredge or fill materials into jurisdictional wetlands to qualify for the silvicultural exemption under Section 404 (f) of the Clean Water Act. Compliance with BMPs is recommended on all sites on which there is a potential for violating water quality criteria as defined by the South Carolina Pollution Control Act".

As noted above, BMP implementation rates are high across the United States. Studies on the effectiveness of BMPs have been and are being accomplished. 'Effectiveness of Forestry Best Management Practices in the United States: A Literature Review' (Cristan et al., 2015) examined 81 research studies related to BMP effectiveness across the US. Thirty-one of these research studies occurred in the western US, 20 in the northern US, and 30 in the southern US. Those in the south focus primarily on the Piedmont and Coastal Plain physiographic regions, which make up most of the area encompassed by this RBA. The studies focused on timber harvesting, stream crossings, streamside management zones (SMZs), forest road construction and maintenance, site preparation, and other categories. The review indicates that BMPs protect water quality in these various forestry activities when constructed correctly and in adequate numbers. State forestry agencies and their stakeholders have utilized effectiveness research studies to improve upon BMPs. Numerous studies have shown that BMPs are effective in protecting water quality. (NCASI, 2012) One study conducted in Georgia found that "… long-term erosion from roads appeared to be reduced by 70% after reconstruction with BMPs despite a 46% increase in average storm size." (NCASI, 2012, pp 3)

Through partnerships with the US EPA, state environmental regulatory agencies, and various stakeholders within and outside the forestry community, state forestry agencies successfully develop, implement, improve, and monitor BMP programs to prevent non-point pollutants from impacting water in the United States, including the RBA geography. They are looked upon by certification schemes and customers of US forest products to validate sustainable forest management that protects water and other natural resources.

In addition, training programs exist within the RBA's geography area to educate loggers, foresters, and others within the wood and biomass supply chain of the BMP program in each of the states in the RBA geography. Georgia's Master Timber Harvester Program, Florida's Master Logger Program, and South Carolina's Timber Operation Professional Program all provide a 2-day initial training designed to improve safety, efficiency, and environmental protection, including BMP training by the state forestry agency. The Georgia program requires 8 hours of continuing education training within a 2-year period and currently has just under 1,400 participants who are current in their training database. Florida's program requires 4 hours of continuing education annually and has over 400 participants who are current in their training database. South Carolina's program requires 2-3 hours annually and has over 1,100 participants who are current in their training database. Based on interviews, pellet producers in the region include training requirements for the suppliers.

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ANNEX VI: FOREST INVENTORY AND ANALYSIS NATIONAL PROGRAM

The U.S. Forest Service's Forest Inventory and Analysis (FIA) program's mission is to conduct and continuously update a comprehensive inventory and analysis of the present and prospective conditions of the renewable resources of the forest and rangelands of the United States. The program collects data and reports on status and trends in forest area and location; in the species, size, and health of trees; in total tree growth, mortality, and removals by harvest; in wood production and utilization rates by various products; and in forest land ownership. Nearly a century old, this program provides thorough, scientifically credible data on the extent, condition, volume, growth, depletion, and health of our nation's forest resources and measures these changes over time. This information helps researchers, policymakers, landowners, and natural resource professionals better understand current forest conditions and identify and track significant changes. FIA is the only program that provides consistent and credible data for all forest lands (public and private). Although the United States Forest Service (USFS) administers the program, the USFS partners with State agencies (such as the Southern Research Station in the scope of this RBA) and private contractors to conduct the program and continuously update a comprehensive inventory and analysis of forest resources. This program is federally mandated: the 1998 Farm Bill requires FIA to collect data annually on plots within each state.

Sampling and data collection may vary between states. Some states choose to increase the sample intensity by installing additional plots, and each field unit develops staffing plans at the local level. However, all field data collectors receive standardized training and must pass a certification test before collecting data. A minimum number of plots must be measured to achieve the area's required standard errors and volume estimates consistent with historical levels. Inventory data is collected on a grid of permanent plots. The FIA program uses hexagons of equal area to establish monitoring plots systematically across the landscape and regularly spaced in time. Each hexagon contains 5,937.2 acres. Selecting one plot for each hexagon brings the sampling intensity close to the one field plot per 6000 acres estimated to meet mandated national sampling precision. A variety of grids and methods are employed by FIA to locate field plots within the hexagon. Inventory crews use rigorous procedures to take measurements on each plot that include species, size, and condition of trees, evidence of harvesting, insects, and diseases, fire, or other forest impacts.

The FIA program includes several levels of analysis: annual reports, periodic reports by state, periodic national reports, and issue-driven "special studies" using FIA data (which are generally funded externally by interested partners). Each of these reports is published and available publicly. Forest resource reports are available for individual States and National Forests; data and tables are available on the Web or by special request. Updated annual inventory data are available each June. For the annual reports, core data is compiled into a standard set of core tables for each state, which is released in hard copy and electronic formats. Every five years, a complete state analytical report is produced. Each state report includes:
- The current status of the forest-based on the last five years of data
- Trends in forest status and condition over the preceding 20 years, with emphasis on comparing the most recent data with data from the previous period
- Timber product output data

- Analysis and discussion of the probable forces causing the observed conditions
- Projection of the likely trends in key resource attributes over the next 20 years, under various scenarios.

FIA also prepares a National Summary report every five years, which includes the same elements described above but at regional and national scales.

FIA maintains a rigorous quality assurance program, including documentation of methods, training for data collectors, checks of data quality (including in-field for quality control during field operations), and peer review of analysis products. Quality assessments use statistical tools to verify that uncertainty associated with collected data is minimized and that the data are of sufficient quality to support programmatic decisions. Continuous improvement in the FIA program is assured by a variety of internal feedback procedures. FIA data serves as a baseline in the United States for scientific investigations in various areas that involve forest ecosystems. Policymakers and land managers depend upon FIA data, and no other dataset is available that offers this level of comprehensiveness, both geographically and historically.

For more detailed information on the Forest Inventory and Analysis program, please see the USFS fact sheets at https://www.fia.fs.fed.us/library/fact-sheets/index.php

For more information specific to the USFS Quality Assurance (QA) program, see https://www.fia.fs.fed.us/library/fact-sheets/data-collections/QA.pdf.

APPENDIX VII: ATFS CERTIFICATION

RISK-MITIGATION THROUGH A RISK-BASED APPROACH CAN BE MONITORED WITH THE ATFS CERTIFICATION AND AUDIT PROCESS

AMERICAN TREE FARM SYSTEM: FORESTS SUPPORT CLEAN WATER, WILDLIFE HABITAT, RECREATION, AND SUSTAINABLE WOOD SUPPLIES

The American Tree Farm System (ATFS), a landmark, nationwide family landowner engagement, and education program and network, was established more than 75 years ago. Over the last 15 years, ATFS was internationally recognized and endorsed by the Programme for Endorsement of Forest Certification (PEFC) for meeting strict third-party certification standards. The American Forest Foundation (AFF) administers ATFS.

ATFS provides family landowners with the tools, resources, and technical support they need to be effective stewards of the land and address key issues such as conserving biodiversity, reducing the risk of catastrophic wildfire, and addressing the threat of climate change.

ATFS has four primary program elements:
1. A vast community of tree farmers can help each other learn, grow, and share information to manage forests more sustainably.
2. A vast community of locally embedded partners that work together, under the ATFS banner, to engage family landowners, advance their stewardship and wider conservation impacts. These partners include state and federal governments, conservation groups, consulting foresters, forest industry, landowner associations, and others.
3. An established set of sustainability standards to guide landowners on forest management best practices.
4. A third-party assessment process to certify the practices are sustainable.

The ATFS program is administered by 42 state committees, with more than 70,000 tree farmers in the program, managing nearly 19 million acres.

RBA risk mitigation can be monitored through ATFS certification and audit

Presently, ATFS provides certification to between 9-23% of the eligible family-owned acres in the geography of interest, representing a high market penetration and access to the most engaged landowners and those most likely to be supplying wood into the supply chain. Because such a large percentage of eligible Category 2 acreage is certified to ATFS, risk-mitigation measures and monitoring under the RBA may be both undertaken through the ATFS system and related audit process.

A credible, widely recognized brand backed by regular and systematic mitigation monitoring and measurement

Certified land is recognized and easily identified by the widely recognizable green and white diamond-shaped Tree Farm sign. Water, wildlife, recreation, and wood, the four sides of the Tree Farm sign tell the story of sustainable forestry: thriving forestland with clean water, a healthy wildlife habitat, recreational opportunities, and sustainable wood supplies.

For forest products companies, mills, major brand companies, and others looking to source wood fiber from sustainably managed forests, ATFS provides credible verification that good forestry practices occur on the land. ATFS provides a means of regular and systematic mitigation monitoring and measurement for risk-based approaches to sustainability verification and related risk-mitigation measures.

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RISK ASSESSMENT SOURCES (BY PRINCIPLE AND CRITERION)

PRINCIPLE 3: PRODUCTION OF RAW BIOMASS DOES NOT RESULT IN THE DESTRUCTION OF CARBON SINKS.

CRITERION 3.1: Biomass is not sourced from permanently drained land that was classified as peatland on 1 January 2008, unless it can be demonstrated that the production and harvesting of the biomass does not result in water depletion of a previously undrained soil.

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CRITERION 3.2: Biomass is not sourced from land that was converted from a wetland to an alternative, dryer ecosystem after 1 January 2008.

Experts and Stakeholders Consulted

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CRITERION 3.3: Biomass is not sourced from wood plantations that were created by means of conversion of natural forests after 31 December 1997, unless the forest manager is not directly or indirectly responsible for the conversion. Biomass originating from wood plantations that were created after 1997 by means of conversion of degraded natural forests or degraded land is exempt from this requirement on condition that it is ecologically and economically justified to do so and that the forest manager is not directly or indirectly responsible for the degradation.

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CRITERION 4.2: Biomass shall not be sourced from stumps unless these stumps had to be removed from the site for other reasons than wood or biomass production.

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CRITERION 4.3: On average, less than half the volume of the annual round wood harvest from forests is processed as biomass for energy generation. Round wood from thinnings or from production forests with a rotation period of 40 years or less is exempt from this requirement.

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- Sustainable Biomass Program. Supply Base Report: Georgia Biomass LLC. https://sbp-cert.org/wp-content/uploads/1970/01/Supply-Base-Report-v1.3_Fourth-Surveillance-Audit_Georgia-Biomass-FINAL.pdf.
- U.S. Department of Agriculture, Forest Service, Southern Research Station. Timber Product Output and Use for All, 2017. Resource Update FS-xxx. Asheville, NC: 2019. 2 pp. https://doi.org/NA. Retrieved from https://www.fs.usda.gov/srsfia.

PRINCIPLE 6: RELEVANT INTERNATIONAL, NATIONAL, REGIONAL AND LOCAL LAWS AND REGULATIONS ARE COMPLIED WITH.

CRITERION 6.1: The forest manager holds the legal right to use the forest.

Experts and Stakeholders Consulted

- None

Documents Consulted

- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
- Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi. "The Worldwide Governance Indicators: Methodology and Analytical Issues." World Bank Policy Research Working Paper No. 5430. September 2010. SSRN: https://ssrn.com/abstract=1682130.
- The World Bank. Worldwide Governance Indicators. 2019. https://info.worldbank.org/governance/wgi/Home/Reports.

CRITERION 6.2: The forest manager complies with all obligations to pay taxes and royalties.

Experts and Stakeholders Consulted
• None

Documents Consulted
• Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
• Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
• Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi. "The Worldwide Governance Indicators: Methodology and Analytical Issues." World Bank Policy Research Working Paper No. 5430, September 2010. SSRN: https://ssrn.com/abstract=1682130.
• The World Bank. Worldwide Governance Indicators. 2019. https://info.worldbank.org/governance/wgi/Home/Reports.

CRITERION 6.3: All applicable anti-corruption legislation is observed. If no anti-corruption legislation exists, the forest manager must take alternative anti-corruption measures proportionate to the scale and intensity of the management activities and the risk of corruption..

Experts and Stakeholders Consulted
• Clavier, Brian, Chief of Law Enforcement, Georgia Forestry Commission. Interview 1 June 2020.
• Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020.

Documents Consulted
• None

PRINCIPLE 7: BIODIVERSITY IS MAINTAINED AND WHERE POSSIBLE ENHANCED.
CRITERION 7.1: Sites with a high conservation value and representative areas of the forest types that are found in the forest management unit have been identified and are protected and where possible enhanced. The sites may contain one or more of the following values: diversity of species, ecosystems and habitats, ecosystem services, ecosystems at landscape level and cultural values.

Experts and Stakeholders Consulted
• Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
• Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020.
• Stevenson, Randy, Sustainability Forester, Fram Renewable Fuels. Interview 27 May 2020.
• van Tilborg, Elizabeth, Sustainability/Certification Manager, Fram Renewable Fuels. Interview 27 May 2020.

Documents Consulted

- American Tree Farm System®. Standards & Guidance: 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.

- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.

- Florida Fish and Wildlife Conservation Commission. "Florida State Wildlife Action Plan." https://myfwc.com/conservation/special-initiatives/fwli/action-plan.

- Forest Inventory and Analysis (FIA) Database. Most Recent FIA Data by State and Collection Year. https://apps.fs.usda.gov/fia/datamart/recent_load_history.html.

- Forest Stewardship Council US. "Controlled Wood." https://us.fsc.org/en-us/certification/controlled-wood.

- Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.

- Forest Stewardship Council US. FSC-US Forest Management Standard (v1.0) (complete with FF Indicators and Guidance). https://us.fsc.org/en-us/certification/forest-management-certification.

- Georgia Department of Natural Resources. Georgia State Wildlife Action Plan. 2015. https://georgiawildlife.com/sites/default/files/wrd/pdf/swap/SWAP2015MainReport_92015.pdf.

- NatureServe. Commissioned data: ESA, IUCN and NatureServe listings by county for geography of interest. Compiled by NatureServe (Pat Comer and Jason McNees, reported 16 September 2020).

- Regional HCV mapping (FiF)

- South Carolina Department of Natural Resources. "State Wildlife Action Plan." http://dnr.sc.gov/swap/index.html.

- State-specific Landscape Management Plans (LMPs).

- Sustainable Biomass Partnership standards. https://sbp-cert.org/wp-content/uploads/2018/09/sbp-standard-1-feedstock-compliance-standard-v1-0.pdf.

- Sustainable Biomass Program. SBP Guidance Document. https://sbp-cert.org/wp-content/uploads/2019/06/SBP-Guidance-Document_southern-US.pdf.

- Sustainable Forestry Initiative standards. https://www.sfiprogram.org/wp-content/uploads/2015_2019StandardsandRules_Section2_June2019.pdf.

- U.S. and state laws and regulations (U.S. and state protected lands data and state Wildlife Action Plans).

- U.S. Department of Agriculture, Forest Service. Forest Inventory and Analysis (FIA).

- U.S. Fish and Wildlife Service. FAQ on indigenous tribes. https://www.fws.gov/endangered/what-we-do/tribal-faq.html.

CRITERION 7.2: Measures have been taken to protect endangered plant and animal species and, if applicable, to increase the populations and enhance the habitats of these species.

Experts and Stakeholders Consulted

- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Butler, Brett, National Woodland Owner Survey, USDA Forest Service. Interview 19 May 2020.
- Comer, Patrick, Chief Ecologist, NatureServe. Multiple interviews and written documents July through September.
- Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020. Emails 21 May and 9 June 2020.
- van Tilborg, Elizabeth, Sustainability/Certification Manager, Fram Fuels. Interview 27 May 2020.

Documents Consulted

- American Forest Foundation.2017.'Southern Wildlife at Risk: Family Forest Owners Offer a Solution.' http://forestfoundation.org/family-forest-owners-solution-at-risk-wildlife
- Butler Brett J.; Butler, Sarah M.; Caputo, Jesse; Dias, Jacqueline; Robillard, Amanda; Sass, Emma M. In review. Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service, National Woodland Owner Survey. Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Florida Fish and Wildlife Conservation Commission, Florida's Endangered and Threatened Species, Updated December 2018.
- Florida Forestry Association's Master Logger Program http://www.flforestry.org/programs/master-logger/ (accessed 5/15/20)
- FSC Controlled Wood National Risk Assessment for the Conterminous United States of America, 2019,
- https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra
- Ga. Code Ann., § 27-3-130 to 133, Endangered Wildlife Act of 1973, https://www.animallaw.info/statute/ga-endangered-article-5-protection-endangered-wildlife
- Georgia Department of Natural Resources; Georgia Biodiversity Portal; https://georgiabiodiversity.a2hosted.com/natels/home
- Georgia Master Timber Harvester Program https://gamth.org/ (accessed 5/15/20)
- Harris, J. Berton C.; Reid, J. Leighton; Scheffers, Brett R.; Wanger, Thomas C.; Sodhi, Navjot S.; Fordman, Damien A.; Brook, Barry W. Conserving imperiled species: a comparison of the IUCN Red List and U.S. Endangered Species Act. 2011. Conservation Letters)) (2011) 1-9.
- NatureServe Explorer, https://explorer.natureserve.org/
- South Carolina Code 1976 § 50-15-10 to 90, Nongame and Endangered Species Conservation Act, https://www.animallaw.info/statute/sc-endangered-species-chapter-15-nongame-and-endangered-species-conservation-act
- South Carolina Department of Natural Resources; Rare, Threatened and Endangered Species of South Carolina; https://www.dnr.sc.gov/species/state.html
- South Carolinas Timber Operations Professional Program https://www.scforestry.org/top-forestry-programs.htm (accessed 5/15/20)

- United States Code Annotated. Title 16. Conservation. Chapter 35. Endangered Species. Endangered Species Act, 16 USC 1531 – 1544, https://www.animallaw.info/statute/us-endangered-species-chapter-35-endangered-species
- United States Department of Agriculture, Animal and Plant Health Inspection Service, https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/permits/plants-and-plant-products-permits/cites
- U.S. Fish & Wildlife Service. Environmental Conservation Online System. https://ecos.fws.gov/ecp/
- U.S. Fish & Wildlife Service. Defining Success Under the Endangered Species Act - https://www.fws.gov/Endangered/news/episodes/bu-04-2013/coverstory/index.html
- U.S. Fish & Wildlife Service Environmental Conservation Online System (ECOS), https://ecos.fws.gov/ecp/
- West's F. S. A. § 379.2291, Florida Endangered and Threatened Species Act, https://www.animallaw.info/statute/fl-endangered-endangered-and-threatened-species-act
- https://www.biologicaldiversity.org/programs/biodiversity/endangered_species_act/pdfs/Harris_et_al_2011_ESA_and_IUCN.pdf (Corrections issued 09 April 2012: https://conbio.onlinelibrary.wiley.com/doi/10.1111/j.1755-263X.2012.00236.x)

CRITERION 7.3: The conversion of forests within the forest management unit to other forms of land use, including wood plantations, is not permitted unless:
- **the area concerned is small, no greater than 5% of the area of the Forest Management Unit on the benchmark date of 1 January 2008;**
- **it clearly leads to long-term advantages for nature conservation;**
- **and there is no damage or threat of damage to sites with a high conservation value.**

Experts and Stakeholders Consulted
- Butler, Brett, Research Forester and Director of the National Woodland Owner Survey, FIA, USFS. Interview 20 May 2020.
- Kuebler, Caroline, Senior Manager, Woodland Owner Engagement, American Forest Foundation. Interviews 14 and 22 May 2020.
- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Schroeder, Todd, Supervisory Research Forester, Forest Inventory and Analysis (FIA), Southern Research Station, U.S. Department of Agriculture, Forest Service. Email 22 September 2020.
- Turner, Jeffery A., Supervisory Biological Scientist, Forest Inventory and Analysis (FIA), Southern Research Station, U.S. Department of Agriculture, Forest Service. Multiple interviews May and June 2020.

Documents Consulted
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Center for Biological Diversity. Letter to the U.S. Fish and Wildlife Service, 8 June 2018. https://fws.gov/southeast/pdf/letter/cbd-reviews-of-62-southeastern-bin-5-species.pdf.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.

- Forest Inventory and Analysis (FIA) Database. Most Recent FIA Data by State and Collection Year. https://apps. fs.usda.gov/fia/datamart/recent_load_history.html.
- Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
- Forest Stewardship Council US. Controlled Wood Regional Meeting Report, Southeast & Mississippi Alluvial Valley Regions. Atlanta, GA: July 31, 2018. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
- Hewes, Jaketon H., Brett J. Butler and Greg C. Liknes. 2017. Forest Ownership in the Conterminous United States circa 2014: Distribution of Seven Ownership Types — Geospatial Dataset. Fort Collins, CO: Forest Service Research Data Archive. https://doi.org/10.2737/RDS-2017-0007.
- Zhang, Daowei, Brett J. Butler and Rao V. Nagubadi. "Institutional Timberland Ownership in the US South: Magnitude, Location, Dynamics and Management." Journal of Forestry 110, no. 7 (2012): 355–361.

CRITERION 7.4: In the case of wood plantations, there is a preference for native species, and a relevant percentage of the plantation must be able to revert to natural forest at a later stage.

Experts and Stakeholders Consulted
- Bulloch, Bronson, Professor, Forest Biometrics & Quantitative Timber Management; and Co-Director, Plantation Management Research Cooperative (PMRC), Warnell School of Forestry & Natural Resources, University of Georgia. Interview 27 May 2020.
- Butler, Brett, Research Forester and Director of the National Woodland Owner Survey, FIA, USFS. Interview 20 May 2020.
- Enebak, Scott, Associate Dean and Professor, and Director of the Auburn University Southern Forest Nursery Management Cooperative. Interview 1 June 2020.
- Kuebler, Caroline, Senior Manager, Woodland Owner Engagement, American Forest Foundation. Interviews 14 and 22 May 2020.
- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Phillips, Scott, State Forester, South Carolina Forestry Commission. Interview 22 May 2020.
- Turner, Jeffery A., Supervisory Biological Scientist, Forest Inventory and Analysis (FIA), Southern Research Station, U.S. Department of Agriculture, Forest Service. Multiple interviews May and June 2020.
- Volk, Michael Ives, Center for Landscape Conservation Planning, Department of Landscape Architecture, School of Landscape Architecture and Planning, University of Florida, Gainesville. Interview 26 May 2020

Documents Consulted
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Czaplewski, Raymond L. Application of Forest Inventory and Analysis (FIA) Data to Estimate the Amount of Old Growth Forest and Snag Density in the Northern Region of the National Forest System. November 2004. https://www.fs.fed.us/rm/pubs_other/rmrs_2004_czaplewski_r001.pdf.

- Enebak, S. Forest Tree Seedling Production in the Southern United States for the 2017-2018 Planting Season. Technical Note 18-01. Auburn University Southern Forest Nursery Management Cooperative: 2018.
- Georgia Forestry Commission. Seedling brochure, 2020–2021.
- Wear, David N., and John G. Greis, eds. The Southern Forest Futures Project. Gen. Tech. Rep. SRS-GTR-178. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station, 2013. 542 pp. https://www.srs.fs.fed.us/pubs/gtr/gtr_srs178.pdf.
- Zhang, Daowei, Brett J. Butler and Rao V. Nagubadi. "Institutional Timberland Ownership in the US South: Magnitude, Location, Dynamics and Management." Journal of Forestry 110, no. 7 (2012): 355–361.

CRITERION 7.5: Exploitation of non-timber forest products, including products from hunting and fishing, is regulated, monitored and controlled to safeguard the maintenance of the biodiversity in the forests.

Experts and Stakeholders Consulted

- Willard, Risher, Chief of Forest Services, Utilization & Marketing, Georgia Forestry Commission. Interview 3 June 2020.

Documents Consulted

- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Chamberlain, James L., Marla R. Emery and Toral Patel-Weynand. Assessment of Nontimber Forest Products in the United States under Changing Conditions. General Technical Report SRS-GTR-232. U.S. Department of Agriculture, Forest Service, Southern Research Station, 2018. 268 pp. https://doi.org/10.2737/SRS-GTR-232.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Endangered Species Act § 8A, 16 U.S.C. 1537a. http://www.law.cornell.edu/uscode/text/16/1537a.
- Farve, David. "American Wildlife Law – An Introduction." Animal Legal and Historical Center, Michigan State University College of Law: 2003. https://www.animallaw.info/article/american-wildlife-law-introduction.
- Florida Administrative Code, Department 68, Division 68A. https://www.flrules.org/gateway/Division.asp?DivID=347.
- Florida Fish and Wildlife Conservation Commission. "Rules and Regulations." 2020. https://myfwc.com/about/rules-regulations.
- Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
- Georgia Department of Natural Resources. "Regulations." 2019–2020. https://georgiawildlife.com/regulations.
- Georgia Forestry Commission. 2017 Georgia Forestry Laws. https://gatrees.org/wp-content/uploads/2019/11/Forestry-Laws-2017.pdf.
- Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi. "The Worldwide Governance Indicators: Methodology and Analytical Issues." World Bank Policy Research Working Paper No. 5430, September 2010. SSRN: https://ssrn.com/abstract=1682130.

- Official Code of Georgia Annotated, Title 27. https://advance.lexis.com/container/?pdmfid=1000516&crid=c2f6c931-dca9-4f17-a2ae-48b20325ae68&-func=LN.Advance.ContentView.getFullToc&nodeid=AAMAAD&typeofentry=Breadcrumb&config=00JAAzZDg-zNzU2ZC05MDA0LTRmMDItYjkzMS0xOGY3MjE3OWNIODIKAFBvZENhdGFsb2clFfJnJ2IC8XZi1AYM4Ne-&action=publictoc&pddocfullpath=%2Fshared%2Fdocument%2Fstatutes-legislation%2Furn%3Aconten-tItem%3A5YYC-7VF1-JPGX-S1H7-00008-00&pdtocfullpath=%2Fshared%2Ftableofcontents%2Furn%3Aconten-tItem%3A7YJ8-39M0-Y905-D000-00008-00&ecomp=y3_dkkk&prid=ecc18d67-15d9-48ca-8e43-4372c5b19fe6.

- South Carolina Code of Laws Unannotated, Title 50 – Fish, Game and Watercraft. https://www.scstatehouse.gov/code/title50.php.

- South Carolina Code of State Regulations, Chapter 123 – Department of Natural Resources, Articles 2–6. https://www.scstatehouse.gov/coderegs/statmast.php.

- South Carolina Department of Natural Resources. "Regulations." 2020. http://www.dnr.sc.gov/regulations.html.

- The 2019 Florida Statutes, Title XXVIII – Natural Resources: Conservation, Reclamation and Use, Chapter 379 Fish and Wildlife Conservation. http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Index&Title_Request=XXVIII#TitleXXVIII.

- The World Bank. Worldwide Governance Indicators. 2019. https://info.worldbank.org/governance/wgi/Home/Reports.

- United States Electronic Code of Federal Regulations, Title 50, Chapter I, Subchapter B, Part 23. CITES, https://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&tpl=/ecfrbrowse/Title50/50cfr23_main_02.tpl.

- U.S. Fish and Wildlife Service, International Affairs. CITES, https://www.fws.gov/international/cites/index.html.

PRINCIPLE 8: THE REGULATING EFFECT AND THE QUALITY, HEALTH AND VITALITY OF THE FOREST ARE MAINTAINED AND WHERE POSSIBLE ENHANCED.

CRITERION 8.1: The soil quality of the forest management unit is maintained and if necessary improved, with special attention to coasts, riverbanks, erosion-sensitive areas and sloping landscapes.

Experts and Stakeholders Consulted

- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted

- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Cristan, Richard, W. Michael Aust, M. Chad Bolding, Scott M. Barrett, John F. Munsell and Erik Schilling. "Effectiveness of Forestry Best Management Practices in the United States: Literature Review." Forest Ecology and Management (2015). https://www.stateforesters.org/wp-content/uploads/2018/09/Literature-Review-published-in-Forest-Ecology-and-Management.pdf.

- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Dwivedi, Puneet, Chantal Tumpach, Chase Cook, Bob Izlar. Effects of the sustainable forestry initiative fiber sourcing standard on the average implementation rate of forestry best management practices in Georgia, United States. University of Georgia.
- Florida Forestry Association. "Programs: Master Logger." http://www.flforestry.org/programs/master-logger.
- Forestry Association of South Carolina. "Timber Operations Professional Program." https://www.scforestry.org/top-forestry-programs.htm.
- "Georgia Master Timber Harvester Program." https://gamth.org.
- Loehle, Craig, Thomas B. Wigley Jr., Alan Lucier Jr., Erik Schilling, Robert J. Danehy and George Ice. "Toward Improved Water Quality in Forestry: Opportunities and Challenges in a Changing Regulatory Environment." Journal of Forestry 112, no. 1 (January 2014): 41–47. https://doi.org/10.5849/jof.12-111.
- National Association of State Foresters. "Protecting the Nation's Water: State Forestry Agencies and Best Management Practices." December 2019. https://www.stateforesters.org/newsroom/protecting-the-nations-water-state-forestry-agencies-and-best-management-practices.
- National Council for Air and Stream Improvement. Assessing the Effectiveness of Contemporary Forestry Best Management Practices (BMPs): Focus on Roads. Special Report No. 12–01. Research Triangle Park, NC: 2012. https://www.ncasi.org/wp-content/uploads/2019/02/sr12-01.pdf.
- Southern Group of State Foresters. Implementation of Forestry Best Management Practices: 2018 Southern Region Report. https://www.southernforests.org/water/SGSF%20Water%20BMP%20Report%20FINAL.pdf.
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- Walbridge, M.R. "Functions and Values of Forested Wetlands in the Southern United States." Journal of Forestry 91, no. 5 (1993): 15–19. https://www.frames.gov/catalog/34562.
- Yoho, Noel S. "Forest Management and Sediment Production in the South – A Review." Southern Journal of Applied Forestry 4, no. 1 (February 1980): 27–36. https://doi.org/10.1093/sjaf/4.1.27.

CRITERION 8.2: The water balance and quality of both groundwater and surface water in the forest management unit and downstream (outside the Forest Management Unit) shall be at least maintained and where necessary improved.

Experts and Stakeholders Consulted
- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted
- Bristan, Richard, W. Michael Aust, M. Chad Bolding, Scott M. Barrett, John F. Munsell and Erik Schilling. "Effectiveness of Forestry Best Management Practices in the United States: Literature Review." Forest Ecology and Management (2015). https://www.stateforesters.org/wp-content/uploads/2018/09/Literature-Review-published-in-Forest-Ecology-and-Management.pdf.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.

- Florida Forestry Association. "Programs: Master Logger." http://www.flforestry.org/programs/master-logger.
- Forestry Association of South Carolina. "Timber Operations Professional Program." https://www.scforestry.org/top-forestry-programs.htm.
- "Georgia Master Timber Harvester Program." https://gamth.org.
- National Association of State Foresters. "Protecting the Nation's Water: State Forestry Agencies and Best Management Practices." December 2019. https://www.stateforesters.org/newsroom/protecting-the-nations-water-state-forestry-agencies-and-best-management-practices.
- Walbridge, M.R. "Functions and Values of Forested Wetlands in the Southern United States. Journal of Forestry 91 (1993): 15–19. https://www.frames.gov/catalog/34562.

CRITERION 8.3: Important ecological cycles present in the FMU are preserved, including carbon and nutrient cycles.

Experts and Stakeholders Consulted
- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Florida Forestry Association. "Programs: Master Logger." http://www.flforestry.org/programs/master-logger.
- Forestry Association of South Carolina. "Timber Operations Professional Program." https://www.scforestry.org/top-forestry-programs.htm.
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CRITERION 8.4: Unnecessary damage to ecosystems is prevented by applying Reduced Impact Logging and the most suitable road construction methods and techniques for local conditions.

Experts and Stakeholders Consulted

- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted

- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
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- Walbridge, M.R. "Functions and Values of Forested Wetlands in the Southern United States." Journal of Forestry 91, no. 5 (1993): 15–19. https://www.frames.gov/catalog/34562.

CRITERION 8.5: If fires are used to achieve forest management objectives, such as regeneration of specific tree species, then adequate control measures have been taken.

Experts and Stakeholders Consulted

- Clavier, Brian, Chief of Law Enforcement, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted

- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Florida Department of Agriculture and Consumer Services. 2017 Annual Report. 2018. https://www.fdacs.gov/content/download/80670/file/2017_DeptAnnualReport_Web.pdf.
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- The 2019 Florida Statutes, Title XXXV – Agriculture, Horticulture and Animal Industry, Chapter 590 Forest Protection. http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0500-0599/0590/0590.html.

CRITERION 8.6: The forest management measures are designed to prevent and control diseases and pests where these form a threat to natural capital.

Experts and Stakeholders Consulted

- Bates, Chip, Forest Health Coordinator, Georgia Forestry Commission. Interview 4 June 2020.
- Eickwort, Jeffrey, Entomologist and Supervisor, Forest Health Section, Florida Department of Agriculture and Consumer Services, Florida Forest Service. Interview 1 July 2020.
- Jenkins, David, Entomologist/Forest Health Specialist, South Carolina Forestry Commission. Interview 17 June 2020.
- Stine, Bonnie, Assistant Bureau Chief, Forest Management, Florida Department of Agriculture and Consumer Services, Florida Forest Service. Interview 30 June 2020.

Documents Consulted

- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Florida Department of Agriculture and Consumer Services, Florida Forest Service. "Forest Health." https://www.fdacs.gov/Divisions-Offices/Florida-Forest-Service/Our-Forests/Forest-Health.
- Georgia Forestry Commission. "Forest Health." https://gatrees.org/forest-management-conservation/forest-health.
- South Carolina Forestry Commission. "Forest Health." https://www.state.sc.us/forest/id.htm.
- U.S. Department of Agriculture, Animal and Plant Health Inspection Service. 2019 Impact Report. https://www.aphis.usda.gov/publications/aphis_general/rpt-aphis-impact-2019.pdf.
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- U.S. Department of Agriculture, Forest Service, Region 8. "Forest & Grassland Health." https://www.fs.usda.gov/main/r8/forest-grasslandhealth.

CRITERION 8.7: The use of chemicals is only permitted if ecological processes and the optimal deployment of sustainable alternatives prove insufficient. Pesticides classified as Type 1A and 1B by the World Health Organisation (WHO) and chlorinated hydrocarbons are not permitted.

Experts and Stakeholders Consulted

- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Email 20 August 2020.
- Clabo, David, Assistant Professor of Silviculture Outreach, Warnell School of Forestry & Natural Resources, University of Georgia. Interview 20 August 2020.
- Demers, Chris, Extension Program Manager – Florida Land Steward, School of Forest Resources and Conservation, University of Florida IFAS Extension. Emails 19 and 20 August 2020.
- Holland, Robin, BMP Forester, Florida Department of Agriculture and Consumer Services, Florida Forest Service. Email 20 August 2020, via Chris Demers.
- McCarty, Elizabeth, Forest Health Specialist, Warnell School of Forestry & Natural Resources, University of Georgia. Interview 20 August 2020.
- Nowak, Jarek, Utilization and Hydrology Supervisor, Florida Department of Agriculture and Consumer Services, Florida Forest Service. Email 20 August 2020, via Chris Demers.
- Sanders, Buford, State Stewardship Coordinator, Georgia Forestry Commission. Email 19 August 2020.

Documents Consulted

- Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE). Public Report on the Assessment of Certification Scheme ATFS against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications. June 2019.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). 7 U.S.C. §§ 121–136y. http://www.law.cornell.edu/uscode/text/7/chapter-6.
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- United States Environmental Protection Agency. Restricted Use Product Summary Report. 24 October 2019. https://www.epa.gov/sites/production/files/2019-10/documents/rup-report-oct2019.pdf.
- World Health Organization. The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification, 2019. https://apps.who.int/iris/bitstream/handle/10665/332193/9789240005662-eng.pdf?ua=1.

CRITERION 8.8: THE ACCUMULATION OF INORGANIC WASTE AND LITTER IS PREVENTED, OR SUCH WASTE AND LITTER IS COLLECTED, STORED IN APPROVED AREAS AND DISPOSED OF RESPONSIBLY.

Experts and Stakeholders Consulted
- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted
- Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE). Public Report on the Assessment of Certification Scheme ATFS against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications. June 2018.
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
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- Florida Forestry Association. "Programs: Master Logger." http://www.flforestry.org/programs/master-logger.
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- Southern Group of State Foresters. Implementation of Forestry Best Management Practices: 2018 Southern Region Report. https://www.southernforests.org/water/SGSF%20Water%20BMP%20Report%20FINAL.pdf.
- Southern Group of State Foresters, Water Resources Committee. Silviculture Best Management Practices Implementation Monitoring: A Framework for State Forestry Agencies. 2007. https://www.southernforests.org/water/SGSF%20Regional%20BMP%20Framework%20Protocol%20publication_2007.pdf.
- State of Florida Statutes, Chapter 403 Environmental Control, Section 403.413 Florida Litter Law.
- State of Georgia. Comprehensive Litter Prevention and Abatement Act of 2006.

PRINCIPLE 9: THE PRODUCTION CAPACITY FOR WOOD PRODUCTS AND RELEVANT NON-TIMBER FOREST PRODUCTS IS MAINTAINED IN ORDER TO SAFEGUARD THE FUTURE OF THE FORESTS.

CRITERION 9.1: The production capacity of all forest types represented in the forest management unit is maintained.

Experts and Stakeholders Consulted
- Adams, Tim, Resource Development Division Director, South Carolina Forestry Commission. Interview 9 September 2020.
- McClellan, Mark, Staff Forester and Stewardship Coordinator, Georgia Forestry Commission. Interview 1 September 2020.
- Sanders, Buford, State Stewardship Coordinator, Georgia Forestry Commission. Interview 1 September 2020.
- Vanderwerff, Joe, Northwest Florida Regional Coordinator, Florida Department of Agriculture and Consumer Services, Florida Forest Service. Interview 1 September 2020.

Documents Consulted
- American Tree Farm System®. Standards & Guidance 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.
- Brandeis, Thomas J., Consuelo Brandeis and Andrew J. Hartsell. South Carolina's Forests, 2016. Resource BulletinSRS-215. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station, 2018. 74 pp.
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Chamberlain, James L., Marla R. Emery and Toral Patel-Weynand. Assessment of Nontimber Forest Products in the United States under Changing Conditions. General Technical Report SRS-GTR-232. U.S. Department of Agriculture, Forest Service, Southern Research Station, 2018. 268 pp. https://doi.org/10.2737/SRS-GTR-232.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
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- Sustainable Forestry Initiative. SFI 2015–2019 Forest Management Standard. January 2015. https://www.sfiprogram.org/wp-content/uploads/2015_2019StandardsandRulesSection2Oct2015.pdf.
- The Forest Stewardship Management Plan guidance from Clemson Cooperative Extension. https://sref.info/resources/publications/the-forest-stewardship-management-plan/at_download/file.
- University of Georgia. Georgia Farm Gate Value Report 2018. https://caed.uga.edu/content/dam/caes-subsite/caed/publications/annual-reports-farm-gate-value-reports/2018%20Farm%20Gate.pdf.
- U.S. Department of Agriculture, Forest Service. Forest Stewardship Program: National Standards and Guidelines. https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf.
- U.S. Department of Agriculture, Forest Service. Forests of Florida, 2017. Resource Update FS-255. Asheville, NC: 2020. 2 pp. https://doi.org/10.2737/FS-RU-255.
- U.S. Department of Agriculture, Forest Service. Forests of Georgia, 2018. Resource Update FS-254. Asheville, NC: 2020. 2 pp. https://doi.org/10.2737/FS-RU-254.
- U.S. Department of Agriculture, Forest Service. Forests of South Carolina, 2018. Resource Update FS-221. Asheville, NC: 2019. 2 pp. https://doi.org/10.2737/FS-RU-221.
- Zhang, Daowei, Brett J. Butler and Rao V. Nagubadi. "Institutional Timberland Ownership in the US South: Magnitude, Location, Dynamics and Management." Journal of Forestry 110, no. 7 (2012): 355–361.

CRITERION 9.2: THE FOREST MANAGEMENT UNIT IS SUFFICIENTLY PROTECTED AGAINST ALL FORMS OF ILLEGAL EXPLOITATION OF TIMBER AND NON-TIMBER FOREST PRODUCTS, INCLUDING HUNTING AND FISHING, ILLEGAL ESTABLISHMENT OF SETTLEMENTS, ILLEGAL LAND USE, ILLEGALLY INITIATED FIRES AND ANY OTHER ILLEGAL ACTIVITIES.

Experts and Stakeholders Consulted
- None

Documents Consulted
- Assessment of Certification Scheme ATFS against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications. June 2019.
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
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- Edgefield County South Carolina Assessor's Office. http://qpublic.net/sc/edgefield.
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- Seneca Creek Associates, LLC., prepared for the American Hardwood Export Council. Assessment of Lawful Sourcing and Sustainability: U.S. Hardwood Exports. December 2017 (revised June 2019). https://www.americanhardwood.org/en/latest/news/seneca-creek-study.
- The World Bank. Worldwide Governance Indicators. 2019. https://info.worldbank.org/governance/wgi/Home/Reports.
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PRINCIPLE 10: SUSTAINABLE FOREST MANAGEMENT IS ACHIEVED THROUGH A MANAGEMENT SYSTEM.

CRITERION 10.1: The forest management system is designed to achieve the objectives of a forest management plan and covers the inventory, analysis, planning, implementation, monitoring, evaluation and adjustment cycle.

Experts and Stakeholders Consulted

- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020.
- Stevenson, Randy, Sustainability Forester, Fram Renewable Fuels. Interview 27 May 2020.
- van Tilborg, Elizabeth, Sustainability/Certification Manager, Fram Renewable Fuels. Interview 27 May 2020.

Documents Consulted

- Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE). Evaluation of ATFS. https://adviescommissiedbe.nl/file/download/50707581/ATFS+Stakeholder+report+%282018-06%29.pdf
- American Tree Farm System®. Standards &Guidance 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Georgia Forestry Commission. Georgia's Forest Stewardship Program standards. https://gatrees.org/wp-content/uploads/2020/02/Standards-for-Forest-Stewardship-Plans-Renewals.pdf.
- Sustainable Forestry Initiative. SFI 2015–2019 Forest Management Standard. January 2015. https://www.sfiprogram.org/wp-content/uploads/2015_2019StandardsandRulesSection2Oct2015.pdf.
- The Forest Stewardship Management Plan guidance from Clemson Cooperative Extension. https://sref.info/resources/publications/the-forest-stewardship-management-plan/at_download/file.
- U.S. Department of Agriculture, Forest Service. Forest Stewardship Program: National Standards and Guidelines. https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf.

CRITERION 10.2: A FOREST MANAGEMENT PLAN IS DRAWN UP THAT AT LEAST INCLUDES:

- **A DESCRIPTION OF THE CURRENT CONDITION OF THE FOREST MANAGEMENT UNIT;**
- **LONG-TERM GOALS FOR THE ECOLOGICAL FUNCTIONS OF THE FOREST MANAGEMENT UNIT;**
- **THE ANNUAL ALLOWABLE CUT PER FOREST TYPE AND, IF APPLICABLE, THE ANNUAL ALLOWABLE HARVEST OF NON-TIMBER FOREST PRODUCTS BASED ON RELIABLE AND CURRENT DATA;**
- **BUDGET PLANNING FOR THE IMPLEMENTATION OF THE FOREST MANAGEMENT PLAN.**

Experts and Stakeholders Consulted

- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020.
- Stevenson, Randy, Sustainability Forester, Fram Renewable Fuels. Interview 27 May 2020.
- van Tilborg, Elizabeth, Sustainability/Certification Manager, Fram Renewable Fuels. Interview 27 May 2020.

Documents Consulted

- Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE). Evaluation of ATFS.
- American Tree Farm System®. Standards & Guidance 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.
- Butler, Brett J.; Kilgore, Michael A.; Snyder, Stephanie A.; Markowski-Lindsay, Marla A.; Catanzaro, Paul F.; Kittredge, David B.; Andrejczyk, Kyle; Dickinson, Brent J.; Eryilmaz, Derya; Hewes, Jaketon H.; Randler, Paula; Tadle, Donna. 2013. Evaluation of the effectiveness and reach of the educational programs and technical assistance activities of the U.S. Forest Service, Forest Stewardship Program: Technical report. Amherst, MA: USDA Forest Service-University of Massachusetts Amherst Family Forest Research Center. 169 p.
- Clemson Cooperative Extension. The Forest Stewardship Management Plan Guidance. https://sref.info/resources/publications/the-forest-stewardship-management-plan/at_download/file.
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- Sustainable Forestry Initiative. SFI 2015–2019 Forest Management Standard. January 2015. https://www.sfiprogram.org/wp-content/uploads/2015_2019StandardsandRulesSection2Oct2015.pdf.
- U.S. Department of Agriculture, Forest Service. Forest Stewardship ProgramStandards. https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf.

CRITERION 10.3: ESSENTIAL ELEMENTS FOR THE MANAGEMENT OF THE FOREST ARE INDICATED ON MAPS.

Experts and Stakeholders Consulted

- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Parrish, Barry, Director of Procurement and Sustainability, Georgia Biomass. Interview 18 May 2020. Emails 21 May and 9 June 2020.
- Stevenson, Randy, Sustainability Forester, Fram Renewable Fuels. Interview 27 May 2020.
- van Tilborg, Elizabeth, Sustainability/Certification Manager, Fram Renewable Fuels. Interview 27 May 2020. Email 9 June 2020.

Documents Consulted

- American Tree Farm System®. Standards & Guidance 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.
- Clemson Cooperative Extension. The Forest Stewardship Management Plan Guidance. https://sref.info/resources/publications/the-forest-stewardship-management-plan/at_download/file.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Georgia Forestry Commission. Georgia's Forest Stewardship Program standards. https://gatrees.org/wp-content/uploads/2020/02/Standards-for-Forest-Stewardship-Plans-Renewals.pdf.
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- U.S. Department of Agriculture, Forest Service. Forest Stewardship Program: National Standards and Guidelines. https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf.

CRITERION 10.4: THE IMPLEMENTATION OF THE FOREST MANAGEMENT PLAN IS PERIODICALLY MONITORED AND THE ECOLOGICAL EFFECTS OF THE FOREST MANAGEMENT ARE EVALUATED.

Experts and Stakeholders Consulted

- Kuebler, Caroline, Senior Manager, Woodland Owner Engagement, American Forest Foundation. Interviews 14 and 22 May 2020.
- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Phillips, Scott, State Forester, South Carolina Forestry Commission. Interview 22 May 2020.
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Documents Consulted

- American Tree Farm System®. Standards & Guidance 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/b0872a8dc122128baacea886ebf468f1/pdf/final_standards_guidance_7.9.15_links.pdf.
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- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.

- Florida's and South Carolina's Landscape Management Plans (LMPs) final draft documents.
- Forest Stewardship Council US. "Forest Management Certification," standards and principles. https://us.fsc.org/en-us/certification/forest-management-certification.
- Public Report on the Assessment of Certification Scheme FSC United States by the Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) Against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications, November 2019. https://zoek.officielebekendmakingen.nl/stcrt-2020-2387.html
- U.S. Department of Agriculture, Forest Service. Forest Stewardship Program: National Standards and Guidelines. Rev. October 2015. https://www.fs.fed.us/spf/coop/library/fsp_standards_guidelines.pdf.

CRITERION 10.5: THE FMP IS IMPLEMENTED BY PROFESSIONAL OFFICE AND FIELD STAFF, WHOSE EXPERTISE AND KNOWLEDGE IS MAINTAINED BY MEANS OF AN EFFECTIVE AND REGULAR TRAINING PROGRAMME.

Experts and Stakeholders Consulted
- Bosworth, Laura, Florida Master Logger Program Coordinator, Florida Forestry Association. Interview 27 May 2020.
- Thackston, Scott, Water Quality Program Coordinator, Georgia Forestry Commission. Interview 2 June 2020.

Documents Consulted
- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Florida Forestry Association. "Programs: Master Logger." http://www.flforestry.org/programs/master-logger.
- Forestry Association of South Carolina. "Timber Operations Professional Program." https://www.scforestry.org/top-forestry-programs.htm.
- "Georgia Master Timber Harvester Program." https://gamth.org.
- National Association of State Foresters. "Protecting the Nation's Water: State Forestry Agencies and Best Management Practices." December 2019. https://www.stateforesters.org/newsroom/protecting-the-nations-water-state-forestry-agencies-and-best-management-practices.

PRINCIPLE 11: FOREST MANAGEMENT BY A GROUP OR REGIONAL ASSOCIATION OFFERS SUFFICIENT SAFEGUARDS FOR SUSTAINABLE FOREST MANAGEMENT.

CRITERION 11.1: A group or regional association is led and supervised by an independent legal entity.

CRITERION 11.2: A group or regional association shall meet the requirements for Sustainable Forest Management. The separate forest management activities of the individual members of the group or regional association shall also meet these requirements, if applicable for the management of the forest concerned.

Experts and Stakeholders Consulted

- Kuebler, Caroline, Senior Manager, Woodland Owner Engagement, American Forest Foundation. Interviews 14 and 22 May 2020.
- Logan, Stephen, VP, Quality Assurance Programs, F&W Forestry Services. Interview 21 May 2020.
- Phillips, Scott, State Forester, South Carolina Forestry Commission. Interview 22 May 2020.

Documents Consulted

- Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE). Public Report on the Assessment of Certification Scheme ATFS against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications. June 2019.
- American Tree Farm System® Independently Managed Group (IMG) Certification Standards 2015–2020. https://www.treefarmsystem.org/stuff/contentmgr/files/2/a6015d533f6ef42fcf381dc813b15c39/pdf/final_atfs_img_standards_jan12015.pdf.
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- Butler, Brett J., Sarah M. Butler, Jesse Caputo, Jacqueline Dias, Amanda Robillard and Emma M. Sass. In review. "Family Forest Ownerships of the United States, 2018: Results from the USDA Forest Service's National Woodland Owner Survey." Res. Bull. NRS-XX. Madison, WI: U.S. Department of Agriculture, Forest Service, Northern Research Station.
- Crow, Fernholz, Woodworth, Zapeda-Almazan. AFF Risk-Based Approach Stakeholder Survey. May-June 2020. Results compiled by American Forest Foundation.
- Forest Stewardship Council US. Controlled Wood National Risk Assessment for the Conterminous United States of America. 2019. https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra.
- Forest Stewardship Council US. FSC Standard for Group Entities in Forest Management Groups, FSC STD 30 005V1.1, approval date 21 December 1997.
- Forest Stewardship Council US. FSC-US Forest Management Standard (v1.0) (complete with FF Indicators and Guidance). https://us.fsc.org/en-us/certification/forest-management-certification.
- Georgia Forestry Commission. Sample contracts. https://gatrees.org/wp-content/uploads/2020/02/SAMPLE-private-timber-sale-agreement-per-unit.pdf.
- Public Report on the Assessment of Certification Scheme FSC United States by the Advisory Commission on Sustainability of Biomass for Energy Applications (ADBE) Against the Dutch Sustainability Criteria for Solid Biomass for Energy Applications, November 2019. https://zoek.officielebekendmakingen.nl/stcrt-2020-2387.html
- South Carolina Forestry Commission. Sample contracts. https://www.state.sc.us/forest/forestsaleagreement.pdf.
- The World Bank. Worldwide Governance Indicators. 2019. https://info.worldbank.org/governance/wgi/Home/Reports.

APPENDIX II: RISK ASSESSMENT SUMMARY TABLE

The below table is a comprehensive summary of the risk assessment results. Included in the summary are the Criterion, Criterion Risk Rating, Indicator, Risk Topic, Indicator Risk Rating, and AFF's Recommended Mitigation.

Criterion	Criteron Risk Rating	Indicator	Risk Topic	Indicator Risk Rating	AFF Recommended Mitigation
3.1	Low	3.1.1	Peatland	Low	N/A
		3.1.2	Peatland	Low	N/A
3.2	Low	3.2.1	Wetland	Low	N/A
3.3	Low	3.3.1	Plantations	Low	N/A
		3.3.2	Plantations/ Conversion	Low	N/A
4.1	Low	4.1.1	Carbon stocks	Low	N/A
4.2	Low	4.2.1	Stumps	Low	N/A
		4.2.2	Stumps	Low	N/A
		4.2.3	Stumps	Low	N/A
4.3	Low	4.3.1	Roundwood	Low	N/A
		4.3.2	Roundwood	Low	N/A
6.1	Low	6.1.1	Legal right	Low	N/A
6.2	Low	6.2.1	Taxes	Low	N/A
6.3	Low	6.3.1	Anti-corruption	Low	N/A
7.1	Specified	7.1.1	HCVs	Specified locally	Mitigation is required for pellet producers where areas of specified risk for Critical Biodiversity Areas and Primary Forest Types, as identified by the FSC US Controlled Wood National Risk Assessment (NRA), fall within their primary roundwood sourcing area. AFF has developed an alogrithm for determining the appropriate area of HCVs to be protected or enhanced based on a number of variables including volume of category 2 material procured.
		7.1.2	HCVs	Specified locally	
		7.1.3	HCVs	Specified locally	
7.2	Low	7.2.1	T&E species	Low	N/A
		7.2.2	T&E species	Low	N/A

Criterion	Criteron Risk Rating	Indicator	Risk Topic	Indicator Risk Rating	AFF Recommended Mitigation
7.3	Specified	7.3.1	Conversion	Low	N/A
		7.3.2	Conversion	Specified locally	To address specified risks for conversion, pellet producers must implement a 2-part mitigation measure combining: (1)use of LMPs and (2) the engagement of family landowners owning currently forested properties and continued management resulting in the retention of forest. The intent of the mitigation is to increase the number of acres under management by an LMP, thereby resulting in the maintenance of forests and mitigating the risk of sourcing materials from sites where forest is being converted within biomass sourcing area. AFF has developed an alogrithm for determining the appropriate area of forest to be retained as forest based on a number of variables including volume of category 2 material procured.
		7.3.3	Conversion	Specified locally	
7.4	Low	7.4.1	Natives	Low	N/A
		7.4.2	Natives	Low	N/A
		7.4.3	Representative stands	Low	N/A
7.5	Low	7.5.1	Non-timber uses	Low	N/A
8.1	Low	8.1.1	Soils/BMPs	Low	N/A
		8.1.2	Soils/BMPs	Low	N/A
8.2	Low	8.2.1	Water/BMPs	Low	N/A
		8.2.2	Water/BMPs	Low	N/A
8.3	Low	8.3.1	BMPs	Low	N/A
		8.3.2	BMPs	Low	N/A
8.4	Low	8.4.1	Reduced Impact Logging	Low	N/A
		8.4.2	RIL/BMPs	Low	N/A
8.5	Low	8.5.1	Fire	Low	N/A
8.6	Low	8.6.1	Pests & Diseases	Low	N/A
		8.6.2	Pests & Diseases	Low	N/A
8.7	Low	8.7.1	Chemicals	Low	N/A
		8.7.2	Chemicals	Low	N/A
		8.7.3	Chemicals	Low	N/A
		8.7.4	Chemicals	Low	N/A
8.8	Low	8.8.1	Waste disposal	Low	N/A
		8.8.2	Waste disposal	Low	N/A
		8.8.3	Waste disposal	Low	N/A

Criterion	Criteron Risk Rating	Indicator	Risk Topic	Indicator Risk Rating	AFF Recommended Mitigation
9.1	Low	9.1.1	AAC	Low	N/A
		9.1.2	AAC	Low	N/A
		9.1.3	AAC	Low	N/A
9.2	Low	9.2.1	Illegal use	Low	N/A
		9.2.2	Illegal use	Low	N/A
		9.2.3	Illegal use	Low	N/A
10.1	Low	10.1.1	Forest management	Low	N/A
		10.1.2	Forest management	Low	N/A
10.2	Specified	10.2.1	FMP	Specified	To address specified risks for presence and quality of management plans, pellet producers must implement specific mitigation utilizing and expanding LMP use, combined with monitoring over the duration of RBA use, proportionate to their Category 2 sourcing. Pellet producers must demonstrate that a Category 2 land area, commensurate with the production of the specified volume of pellets, is newly enrolled for management under an LMP in the year the wood is harvested. A pellet producer must maintain the previous year's LMP enrolled land base, while adding new acres under LMP management in each successive year, for the duration of their use of the RBA. AFF has developed an alogrithm for determining the appropriate area of forest to be enrolled under an LMP based on a number of variables including volume of category 2 material procured.
10.3	Low	10.3.1	Maps	Low	N/A
		10.3.2	Maps	Low	N/A
10.4	Specified	10.4.1	Monitoring	Specified	To address specified risks associated with the lack of management plans and associated monitoring, pellet producers must implement specific mitigation utilizing and expanding LMP use, combined with monitoring over the duration of RBA use, proportionate to their Category 2 sourcing. LMPs include measures for site-level monitoring with reference to a range of attributes and activities and changes in conditions that could impact achievement of management objectives. Additionally, the LMPs themselves will be monitored and adapted as necessary to account for changing conditions. LMPs are entirely inclusive of all SDE+ requirements, including monitoring. AFF has developed an alogrithm for determining the appropriate area of forest to be enrolled under an LMP based on a number of variables including volume of category 2 material procured.
		10.4.2	Monitoring	Specified	

Criterion	Criteron Risk Rating	Indicator	Risk Topic	Indicator Risk Rating	AFF Recommended Mitigation
10.5	Low	10.5.1	Training	Low	N/A
		10.5.2	Training	Low	N/A
		10.5.3	Training	Low	N/A
11.1	Low	11.1.1	Group association	Low	N/A
		11.1.2	Group association	Low	N/A
		11.1.3	Group association	Low	N/A
11.2	Low	11.2.1	Group association	Low	N/A
		11.2.2	Group association	Low	N/A

The above table is a comprehensive data summary of the risk levels found with the geographic scope of the Risk Based Approach. Included in the summary are the Criterion, Criterion Risk Rating, Indicator, Risk Topic, Indicator Risk Rating, and AFF's Recommended Mitigation.

APPENDIX III: DATA SOURCES USED TO SUPPORT RISK ASSESSMENT ANALYSES AND CONCLUSIONS

File Name: FIA Forest Area by Species Group and County

Summary Description: Provides total forest area (acres) for each county in the RBA region as well as forest area for each species group relevant for the RBA region. Data is sourced from the most recent USDA Forest Service Forest Inventory and Analysis National Program (FIA) measurements. Information is provided for the total area, as well as total area by state for each species group. Family Forest Ownership (FFO) ratios are applied tot total forest area to generate estimates by species group for Category 2 lands. Introduced species groups are isolated to demonstrate area planted with exotic species.

Criteria that reference this data source: 3.3.1, 3.3.2, 7.4.2, 7.4.3

File Name: FIA Change in Volume by Species Group and County

Summary Description: Provides net growth and harvest information for each county in the RBA region. Data is provided for all merchantable trees (> 5" DBH) in each FIA species group applicable to the RBA region. Volumes are reported in cubic feet. Data is sourced from the most recent FIA measurement and the immediately preceding FIA measurement, and is reported as average annual net growth and average annual harvest during the intervening time period. Current volumes are also provided by county for each species group. Average annual change in net volume is summarized for each county, state and for the entire RBA region. Species groups and counties with a net loss in volume are identified.

Criteria that reference this data source: 4.1.1, 7.4.3, 9.1.1, 9.1.2, 9.1.3

File Name: NLCD Wetlands Conversion 2008 – 2016

Summary Description: Provides area (acres) occupied by wetlands for each county on the RBA region in 2008 and 2016. Data is sourced from the National Land Cover Database which is maintained by the USDI United States Geological Survey (USGS) Earth Resources Observation and Science (EROS) Center. Data is collected for NCLD wetlands classifications 90 Woody Wetlands and 95 Emergent Herbaceous Wetlands. The analysis calculates change in wetland area between 2008 and 2016 for each country and is summarized by state and for the entire RBA region.

Criteria that reference this data source: 3.1.1, 3.2.1

File Name: FIA Forest and Planted Area by County 1995 – 2015

Summary Description: Provides forested area and planted area (acres) for each county in the RBA region. Data is sourced for each of four FIA measurements from 1995 through 2015. Trends in planted area and total forest area are shown at four intervals (1995, 2005, 2010, 2015). Planted area is also presented as a proportion (percentage) of forest area for each county. FFO ratios are applied to provide estimates of total forest and planted forest of Category 2 lands for each county. Change in forest area from 2005 to 2015 is calculated to identify counties with greater than 5% loss in forest land during that period of time. Data is summarized by state and for the entire RBA region.

Criteria that reference this data source: 3.3.1, 3.3.2, 7.3.1, 7.3.2

File Name: Total Forest & FFO Area by County

Summary Description: Provides total land area, forested area, non-forested area, family forest ownership (FFO) by acres and percent of total forest for each county in the RBA region. Each variable is then summarized for each state. Several sources are used to calculate these areas. Total area for each county is derived using the Albers Equal Area methodology used by the USGS and many other governmental agencies. Total forest area for each county is derived from NCLD data. FFO forest area and FFO percent area are derived from USDA Forest Service data. Resulting information for total forested area, FFO area and FFO percent of area are used to produce results for several other data sources. For example, FFO % was applied to other variables in "FIA Forest and Planted Area by County 1995 – 2015" and "FIA Forest Area by Species Group and County".

Criteria that reference this data source: 3.3.1, 3.3.2, 7.3.1, 7.3.2, 7.4.2, 7.4.3

File Name: FSC US CW NRA Specified Risk Areas - County List 10012019

Summary Description: Lists all counties in the conterminous US designated with specified risk in the FSC US Controlled Wood National Risk Assessment. Type of risk is identified for each county. This file is publicly available on the FSC US website.

Criteria that reference this data source: 7.1.1, 7.1.2, 7.3.1, 7.3.2, 7.3.3

APPENDIX IV: LIST OF COUNTIES DESIGNATED SPECIFIC RISK FOR CONVERSION

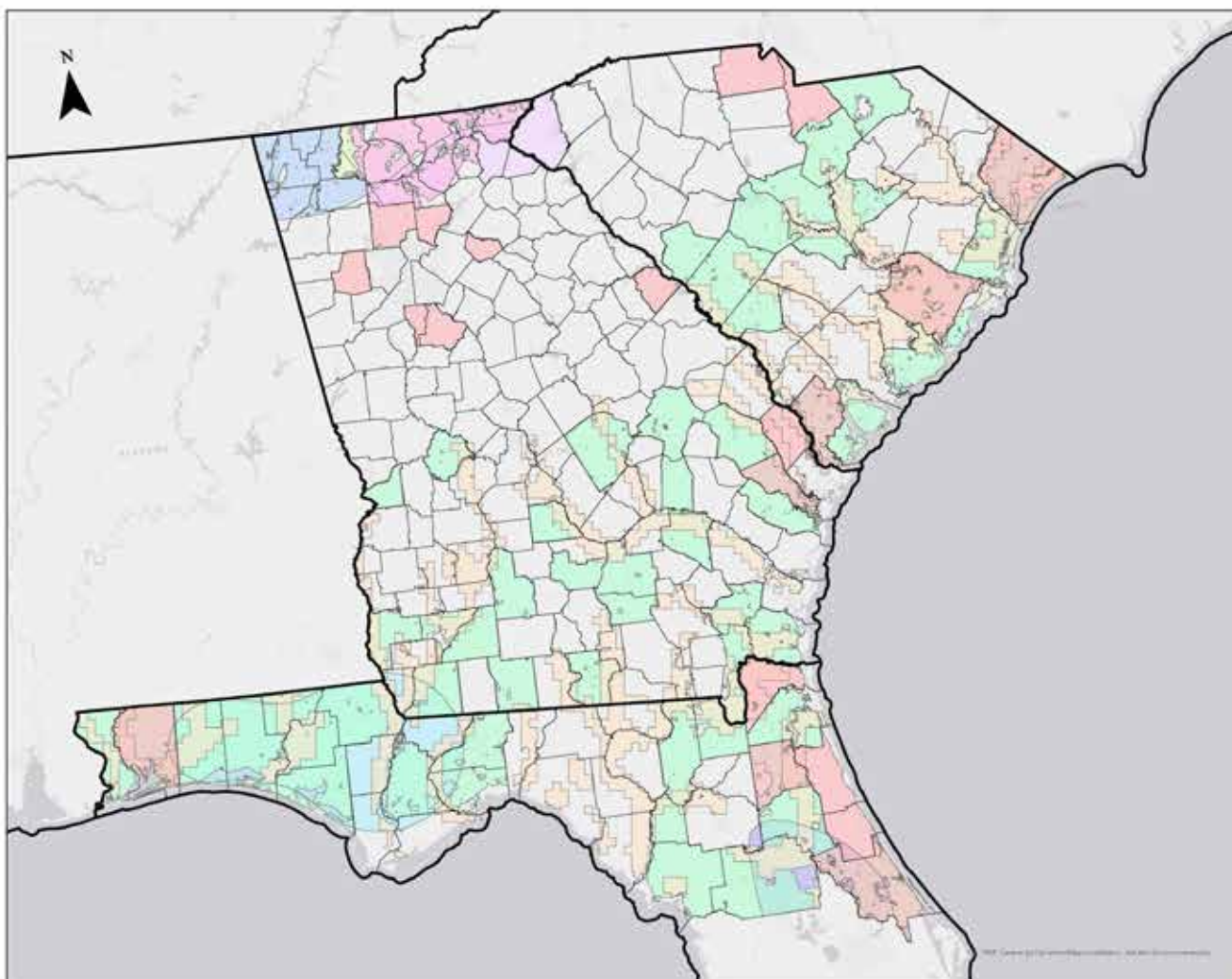| STATE	COUNTY	FSC NRA Specified Risk for Conversion?	Forest loss >5% from 2005 to 2015?	2005 Forest Land	2015 Forest Land	FFO % of Total Forest Land	% Forest Change 2005 - 2015
Florida	Alachua	No	Yes	319,734	302,481	21.92%	-5.40%
Florida	Clay	Yes	No	288,755	292,389	16.11%	1.26%
Florida	Duval	No	Yes	251,517	234,522	4.24%	-6.76%
Florida	Flagler	Yes	No	226,623	219,155	16.21%	-3.30%
Florida	Gilchrist	No	Yes	134,078	112,950	42.65%	-15.76%
Florida	Hamilton	No	Yes	242,950	230,336	43.32%	-5.19%
Florida	Holmes	No	Yes	233,399	208,864	53.18%	-10.51%
Florida	Nassau	Yes	No	294,489	285,989	19.70%	-2.89%
Florida	Putnam	No	Yes	393,362	362,070	18.22%	-7.96%
Florida	St. Johns	Yes	Yes	251,531	236,044	13.12%	-6.16%
Florida	Santa Rosa	Yes	No	500342	501,795	12.93%	0.29%
Florida	Volusia	Yes	No	455190	460,097	14.69%	1.08%
Georgia	Appling	No	Yes	251,564	236,098	61.23%	-6.15%
Georgia	Atkinson	No	Yes	171,560	155,395	69.39%	-9.42%
Georgia	Bacon	No	Yes	144,386	124,111	82.08%	-14.04%
Georgia	Baldwin	No	Yes	126,693	120,321	60.37%	-5.03%
Georgia	Barrow	Yes	Yes	58,038	47,159	77.20%	-18.74%
Georgia	Bartow	No	Yes	193,379	165,739	39.27%	-14.29%
Georgia	Berrien	No	Yes	178,719	163,917	66.32%	-8.28%
Georgia	Bryan	Yes	Yes	209,208	198,339	27.89%	-5.20%
Georgia	Bulloch	No	Yes	324,148	294,318	70.84%	-9.20%
Georgia	Carroll	No	Yes	191,555	173,478	68.25%	-9.44%
Georgia	Chattahoochee	No	Yes	153,311	134,580	11.07%	-12.22%
Georgia	Chattooga	No	Yes	201,352	177,225	53.24%	-11.98%
Georgia	Cherokee	Yes	Yes	168,957	138,083	60.10%	-18.27%
Georgia	Clarke	No	Yes	37,676	25,391	79.03%	-32.61%
Georgia	Clayton	Yes	No	20,556	21,151	6.37%	2.89%
Georgia	Clinch	No	Yes	566,505	537,530	14.15%	-5.11%
Georgia	Coffee	No	Yes	230,633	200,795	72.90%	-12.94%

STATE	COUNTY	FSC NRA Specified Risk for Conversion?	Forest loss >5% from 2005 to 2015?	2005 Forest Land	2015 Forest Land	FFO % of Total Forest Land	% Forest Change 2005 - 2015
Georgia	Columbia	Yes	Yes	111,219	100,214	69.03%	-9.89%
Georgia	Crawford	No	Yes	195,038	175,334	53.88%	-10.10%
Georgia	DeKalb	No	Yes	51,697	44,810	12.65%	-13.32%
Georgia	Dooly	No	Yes	103,946	98,289	58.33%	-5.44%
Georgia	Dougherty	No	Yes	153,773	142,725	28.28%	-7.18%
Georgia	Effingham	Yes	No	239,960	232,727	63.27%	-3.01%
Georgia	Forsyth	Yes	No	58,029	64,734	79.36%	11.55%
Georgia	Franklin	No	Yes	81,580	74,636	91.38%	-8.51%
Georgia	Fulton	No	Yes	139,196	116,465	30.46%	-16.33%
Georgia	Gordon	No	Yes	126,410	118,776	39.00%	-6.04%
Georgia	Gwinnett	No	Yes	106,467	79,424	63.56%	-25.40%
Georgia	Haralson	No	Yes	122,661	115,990	49.88%	-5.44%
Georgia	Heard	No	Yes	140,513	112,350	46.93%	-20.04%
Georgia	Henry	Yes	No	93,147	93,200	68.65%	0.06%
Georgia	Jeff Davis	No	Yes	159,119	144,540	64.97%	-9.16%
Georgia	Johnson	No	Yes	168,026	153,978	71.79%	-8.36%
Georgia	Lanier	No	Yes	105,102	97,887	34.81%	-6.86%
Georgia	Lowndes	No	Yes	219,202	203,963	42.95%	-6.95%
Georgia	Lumpkin	No	Yes	161,554	147,446	36.18%	-8.73%
Georgia	McIntosh	No	Yes	172,686	163,681	13.73%	-5.21%
Georgia	Madison	No	Yes	94,507	88,668	83.02%	-6.18%
Georgia	Newton	No	Yes	83,112	77,425	58.09%	-6.84%
Georgia	Paulding	Yes	Yes	128,560	117,859	39.25%	-8.32%
Georgia	Peach	No	Yes	39,268	35,755	58.59%	-8.95%
Georgia	Pierce	No	Yes	115,706	107,480	85.39%	-7.11%
Georgia	Polk	No	Yes	149,806	127,955	58.06%	-14.59%
Georgia	Rabun	No	Yes	228,644	210,125	12.19%	-8.10%
Georgia	Thomas	No	Yes	219,245	204,887	36.96%	-6.55%
Georgia	Toombs	No	Yes	166,678	158,138	80.15%	-5.12%
Georgia	Union	No	Yes	175,660	149,222	24.20%	-15.05%
Georgia	Wheeler	No	Yes	158,154	148,462	68.66%	-6.13%
South Carolina	Berkeley	Yes	No	586,172	565,249	16.13%	-3.57%
South Carolina	Horry	Yes	No	459,551	473,507	35.79%	3.04%
South Carolina	Jasper	Yes	No	307,295	308,681	37.94%	0.45%
South Carolina	Lancaster	Yes	Yes	279,793	262,230	56.73%	-6.28%
South Carolina	Oconee	No	Yes	275,411	243,308	38.19%	-11.66%
South Carolina	Spartanburg	No	Yes	236,726	221,577	67.36%	-6.40%
South Carolina	York	Yes	Yes	291,822	260,565	54.19%	-10.71%

RISK BASED ASSESSMENT- FSC RISKS - MAY 2020
GEORGIA, SOUTH CAROLINA & NORTH FLORIDA