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FSC US Controlled Wood National Risk Assessment

DRAFT

FIRST PUBLIC CONSULTATION

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FSC US National Risk Assessment

Overview

This document contains programmatic requirements for organizations to make *controlled wood* claims for uncertified materials sourced from the conterminous United States.

This document focuses specifically on Risk Categories 3 (High Conservation Values), and 4 (Conversion), as defined by the FSC National Risk Assessment Framework (PRO-60-002a). FSC International, via a Centralized National Risk Assessment (CNRA), is assessing the other categories of risk. Specifically, there is a CNRA for Legality (Category 1), Traditional and Civil Rights (Category 2), and GMOs (Category 5).

Part 1 of this document contains requirements specific to making *controlled wood* claims in the conterminous US. This Company Controlled Wood Program includes a Due Diligence System (DDS), Controlled Wood Policy, documentation of the supply area, identification of areas of *specified risk* in the supply area, and a company system for addressing *specified risk* in the supply area.

Part 2 includes the framework for High Conservation Values (HCVs) in the conterminous US, including risk designation (i.e. *specified* risk and associated *control measures* for addressing specified risk).

Part 3 is the risk assessment for forestland conversion to non-forest in the conterminous US (risk category 4).

Please see the Glossary (Section VIII or Part 1, below) for definitions associated with the *controlled wood* system.

Part I: Company Controlled Wood Program & Due Diligence System (DDS)

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I. Controlled Wood Program Elements

1.1 For purchases within the conterminous United States, a The Organization's Controlled Wood Program shall contain the elements identified in FSC-STD-40-005 as well as those explicitly required by this National Risk Assessment.

NOTE The Controlled Wood Program elements required in STD-40-005 and the US National Risk Assessment Include:

- Quality Management System (QMS; requirements in Part 1 of FSC-STD-40-005)
- Company Controlled Wood Policy
- Controlled Wood Due Diligence System (CW-DDS)
- Documentation of the Supply Area
- Identification of Areas of Specified Risk in the Supply Area
- Company System for Addressing Specified Risk in the Supply Area
- Monitoring and Evaluation of the Company Controlled Wood Program

II. Company Controlled Wood Policy

2.1 The Company shall have a publically available Controlled Wood Policy that contains the following elements:

2.1.1 A clear statement that The Organization intends to avoid controversial sources.

2.1.2 A general description of the supply area, including material types.

- e.g. softwood logs and chips from the Georgia and South Carolina coastal plain

2.1.3 A summary of the Company Controlled Wood program.

III. Controlled Wood Due Diligence System (CW-DDS)

NOTE The role of the due diligence system in areas of low risk is to recognize that there may be isolated occurrences of controversial sources from within regions of low risk. For example, even within a region of low risk to legality, where timber theft is known to occur, the DDS is designed to avoid those sources. This applies to all CW categories.

3.1 The Organization shall have a due diligence system for all inputs. This CW-DDS is designed to avoid material from where controversial activities are known to occur, regardless of risk designation (i.e. *specified risk* or *low risk*).

3.2 The Organization shall have a publically available summary of the CW-DDS that includes:

3.2.1 A general description of the CW-DDS and any measures taken to avoid controversial sources from within the supply area.

3.2.2 A general description of *specified risk* designations within the supply area, including associated *control measures.*

NOTE This only needs to be a general description of the control measures. Descriptions of HCVs and control measures should be sufficiently detailed to demonstrate compliance with this section, but can be generalized where necessary to protect sensitive or proprietary information.

3.3 The Organization shall incorporate the international due diligence system elements, which are established in Section 4 of the Controlled Wood Standard (STD-40-005).

3.4 The organization shall incorporate the following additional CW-DDS elements:

3.4.1 *Category 1 – Legality*: The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy, material from known sources of illegal harvest.

3.4.2 *Category 2 – Traditional and Civil Rights*: The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy, material from known sources where traditional or civil rights are being violated.

QUESTION FOR CONSULTATION: The role of this part (Category 2) of the due diligence system will ultimately be dependent on the outcome of the Category 2 Centralized National Risk Assessment. If *specified risk* is designated for either civil or traditional rights, control measures will be established in addition to this due diligence provision.

Please comment based on the latest understanding of the Category 2 CNRA.

3.4.3 *Category 3 – High Conservation Values*: The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy, material from sources where it is known that High Conservation Values (HCVs) are threatened by forest management activities.

- The HCVs to be addressed include federally or state designated Endangered or Threatened species where they are known to occur.

3.4.4 *Category 4 – Conversion*: The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy and supplier agreements, material from land where natural forest cover is being converted to non-forest uses or plantations.

NOTE The risk assessment for Conversion is contained in Part 3 of this document. The Controlled Wood Working Group (CWWG) designated *low risk* for Conversion, but with the inclusion of these additional due diligence elements.

NOTE Plantations are defined by FSC to be forest areas, "that lack most of the principle characteristics and key elements of natural forests", as described in Appendix G of the FSC US FM Standard. In the Controlled Wood system, change from natural forest cover to plantation is considered forest conversion.

The following are examples of stand types that are considered plantations:

- Cultivation of exotic species or recognized exotic sub-species. Exceptions to this may include research areas where species' range limits are being explored to address global climate change.
- Block plantings of cloned trees resulting in a major reduction of within-stand genetic diversity compared to what would be found in a natural stand of the same species.
- Stands established through hydrological modification, including the installation of pattern ditching, that affects the water table and resulting stand hydrology.

3.4.4.1 Wood from known instances of conversion of natural or semi-natural forest to plantations is avoided with the following exceptions:

- Instances of conversion of natural or semi-natural forest to plantation of 20 acres or less.

3.4.4.2 Wood from known instances of conversion of natural or semi-natural forest to non-forest conditions is avoided with the following exceptions:

- Instances of conversion of natural forest to non-forest conditions of 40 acres or less, OR
- Instances of conversion resulting directly from the expansion of a FSC Chain of Custody certified mill, OR
- Instances of conversion of natural forest to non-forest conditions within the municipal boundaries of an incorporated city or town, OR
- Instances of conversion as part of a publicly participative and interactive community development plan, OR
- Instances of conversion of natural forest to non-forest conditions as part of a public benefit development such as a right-of-way, power lines, etc.

3.4.5 *Category 5 – Genetically Modified Organisms:* The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy, material from trees that are known to be genetically modified organisms (GMO).

3.4.6 As part of the CW-DDS, the Company consults the FSC US Controlled Wood Stakeholder Portal to determine if there are stakeholder concerns and reports of controversial activities within the Supply Area.

3.4.6.1 Controversial instances noted in the Controlled Wood Stakeholder Portal shall be evaluated by the Organization for accuracy and applicability, and incorporated into the CW-DDS as appropriate.

NOTE The Controlled Wood Stakeholder Portal is an online forum where any stakeholder can post information that is potentially relevant to Controlled Wood. The Stakeholder Portal will be hosted by FSC-US, and is intended to help companies address known instances of controversial sources as part of their DDS.

QUESTION FOR CONSULTATION: In order to ensure the efficacy of the Controlled Wood DDS, should the following elements be required as part of the Controlled Wood Due Diligence System?

- The creation of a "Stakeholder Portal" as discussed above? The Stakeholder Portal is an online forum hosted by FSC US where stakeholders could post known and specific concerns associated with potentially controversial sources. Additionally, is the requirement to consider and evaluate the information contained in the Stakeholder Portal appropriately balanced?
- Supplier Agreements or other measures that require compliance on behalf of the supplier? These elements are currently required where there is *specified risk* (see Section 6.3), but are not incorporated into the broader DDS other than for Conversion.
- Should consultation of relevant databases for threatened and endangered species occurrences (e.g. state Natural Heritage databases or NatureServe) be required as part of the CW-DDS for High Conservation Values (Cat. 3)?

IV. Documentation of the Supply Area

4.1 The Certificate Holder defines the supply area of all materials categorized by input type (direct, indirect, and byproduct).

NOTE The supply area can be defined on the county or state level, or any other level necessary to determine broad risk designation, and does not have to disclose specific supply locations.

4.2 The Organization documents its supply area following procedures found in Annex A.

NOTE These requirements are referenced in FSC-STD-40-005 6.3: *The Organization shall have access to information that allows it to confirm and document the supply area(s).*

NOTE A declaration from the supplier may only be used as a part of the body of documentation for demonstrating the supply area. A supplier declaration alone, even if covered by a contractual agreement, is not considered sufficient proof of the supply area.

NOTE The supply area does not need to be a contiguous area. It may include multiple distinct areas and it may have areas excised from within it.

NOTE The Organization may excise parts of the supply area by verifying that there are no extractive activities taking place in some of these areas (e.g. some public lands), or that the source or types of materials being extracted are different than the types of inputs purchased.

V. Identification of Areas of Specified Risk in the Supply Area

NOTE Identification of the supply area and *specified risk* within the supply area is covered in the Controlled Wood Standard (STD-40-005), specifically in Sections 5 and 6.

5.1 The Organization compares their Supply Area to the FSC US National Risk Assessment to determine areas of *specified risk* within the supply area.

NOTE *Specified risk* and *control measures* have been designated for High Conservation Values (HCVs) by the National Risk Assessment (NRA). They are detailed in Part 2 of this document. If *specified risk* is designated for Category 1 (Legality) or Category 2 (Traditional / Civil Rights) by the Centralized National Risk Assessment (CNRA) being conducted by FSC International, this section will also apply to those designations.

5.2 The Organization identifies and documents the risk designation (i.e. *low risk* or *specified risk*) for all applicable inputs.

5.2.1 Where there is *specified risk*, the Organization identifies and documents the nature of that *specified risk*.

NOTE In some instances, *specified risk* may only be designated for certain product classes. In those cases inputs may be categorized to more clearly define *specified risk*.

VI. Company System for Addressing Specified Risk in the Supply Area

NOTE See Section 7 of FSC-STD-40-005 for generic requirements related to sourcing from areas of *specified risk*, for development of company-developed alternative *control measures*, and for addressing potential contradictions between *control measures* and laws.

6.1 The Organization shall implement designated *control measures* for each instance and type of *specified risk* in their supplies.

6.1.1 Material is avoided from areas and product types for which *control measures* cannot be adequately implemented.

NOTE *Specified risk* and *control measures* have been designated for High Conservation Values (HCVs) by the National Risk Assessment (NRA). They are detailed in Part 2 of this document. If *specified risk* is designated for Category 1 (Legality) or Category 2 (Traditional / Civil Rights) by the Centralized National Risk Assessment (CNRA) being conducted by FSC International, this section will also apply to those designations.

6.2 For each class of inputs (*direct purchases, indirect purchases*, and *byproducts*) for each type of *specified risk* designation, the Organization implements the following elements:

NOTE See Glossary (Section VIII) below for definitions of *direct purchase* types, indirect Purchase Types, and Byproducts.

6.2.1 ***Direct Purchases***

- Organization Controlled Wood Policy
- Supplier Agreements
- Procurement Forester and Supplier Training Program
- Monitoring and Evaluation of the Company Controlled Wood Program
- Field Verification (a component of Monitoring and Evaluation)

6.2.2 ***Indirect Purchases***

- Organization Controlled Wood Policy
- Supplier Agreements for Type 1 Indirect Purchases
- Supplier Training Program
- Monitoring and Evaluation of the Company Controlled Wood Program

6.2.3 ***Byproducts***

- Organization Controlled Wood Policy

6.3 Supplier Agreements: The Organization shall develop written agreements with *direct purchase* and Type 1 *indirect purchase* suppliers ("Supplier Agreements") for each *control measure* that is implemented.

6.3.1 Supplier Agreements shall contain information necessary to implement each *control measure*.

6.3.2 Where Supplier Agreements are not feasible, either of the following alternate measures may be used:

i. Field Verification of *control measure* implementation
   - Shall include a random sampling rate of at least 0.8 times the square root of the number of suppliers.

ii. A Management Plan developed by the supplier that directly addresses the *specified risk* and associated Control Measures, and includes a verification component.

NOTE Verification by other forest certification systems is acceptable where they demonstrate compliance with the management plan in the relevant management units, and both the management plan and audit documents identify the relevant *specified risk* and include the corresponding *control measures*.

6.3.3 Where suppliers do not comply with Supplier Agreements or alternate measures per 6.3.2, the material that is not in compliance is avoided.

QUESTION FOR CONSULTATION: These Supplier Agreements, and alternate measures, are intended to ensure that suppliers comply with the Controlled Wood program while still allowing companies the flexibility to implement verification in a manner that works with their supply chain. Are these measures sufficient, insufficient, or too restrictive?

6.4 Procurement Forester and Supplier Training Program: The Organization trains their procurement foresters and suppliers in the effective implementation of the Company Controlled Wood Policy, and the *control measures* required to address *specified risk*.

NOTE The goal of the training program is to provide procurement foresters and suppliers with sufficiently detailed information regarding The Organization's sourcing expectations, identified *specified risks* in the supply area, and the *control measures* used to mitigate that risk.

6.4.1 For *direct purchases*, the Organization ensures that the relevant procurement foresters and land managers are trained in the effective implementation of *control measures*.

6.4.2 For *indirect purchases*, the Organization ensures that suppliers receive the supplier training information and pass the information as far down the supply chain as necessary to facilitate implementation of the control measures.

6.4.3 The Organization will include *control measures* in their supplier training as applicable in order to address *specified risk.*

NOTE It is recognized that this supplier training program may result in suppliers receiving multiple, potentially conflicting, training programs. FSC-US will develop Regional Processes to come up with regionally standardized Controlled Wood materials where these conflicts arise.

VII. Monitoring and Evaluation of the Company Controlled Wood Program

7.1 Field Verification Program: For *direct purchases*, the Organization develops a field verification program to monitor the implementation and efficacy of *control measures*.

NOTE See Section 7.7 of STD-40-005 for requirements associated with Field Verification as a *control measure*.

7.1.1 The Field Verification Program shall focus on areas where *specified risk* are known or expected to occur, and *control measures* are being implemented.

7.1.2 The rigor of the field verification program shall be commensurate with the level of risk.

7.1.3 The Organization shall visit no less than 0.8 times the square root of the number of its direct purchase supply sites, in accordance with STD-40-005, Section 7.7.5

NOTE The purpose of the Field Verification Program is to monitor and verify the effectiveness of the *control measures* in mitigating risk. Information gathered includes both the rates of implementation of *control measures* as well as perspectives on the effectiveness of the *control measures*, where applicable. For example, if a *control measure* includes leaving particular habitat elements in a stand, the Field Verification Program will verify the implementation of that *control measure*, but may also include information on the effectiveness of that *control measure* to achieve its goal of mitigating risk to HCVs.

7.2 For Organizations sourcing from areas of *specified risk,* the Organization compiles information on each of the following categories with respect to implementation rates and effectiveness in addressing *specified risk.*

- Organization Controlled Wood Policy
- Supplier Agreements
- Supplier Training
- Field Verification (for direct purchases)

7.3 The Organization uses monitoring information to annually evaluate and revise their Controlled Wood Program as necessary.

7.3.1 This assessment includes:

- Any stakeholder engagement processes and outcomes
- Controlled Wood monitoring and effectiveness
- Steps taken to address any non-conformance

7.4 For *indirect purchases*, supplier compliance shall be monitored via monitoring by intermediary suppliers, stakeholder feedback, state agency inspections or reports where relevant, or any other available indirect methods of monitoring information.

7.4.1 Where monitoring of indirect purchases demonstrates noncompliance with the Organization's Controlled Wood Program, that material is avoided.

QUESTION FOR COSULTATION: Given the nature of indirect suppliers, which may include dozens of suppliers separated by multiple links in the supply chain, indirect monitoring per 7.3 above may be the most feasible method for monitoring indirect suppliers. It is recognized, however, that this may not be adequate for identifying and addressing all instances of noncompliance with the Controlled Wood program. Please provide comments on the most appropriate avenue for monitoring *indirect purchases*.

VIII. Glossary

NOTE In some instances, the US Forest Management (FM) Standard definitions are included here as guidance. For the sake of Controlled Wood, the primary definitions included here may differ from those of the FM standard, which is based on the understanding that Controlled Wood and FM certification serve separate purposes at different scales.

Byproduct: Material derived from a production process where it is not a primary product. For the purposes of this document, byproducts include mill residues such as chips, sawdust, slabs, and culls and reclaimed materials. Chips that are generated as a primary product (e.g., from a chip mill) are not considered byproducts.

Control Measure (CM)*:* An action that The Organization shall take in order to mitigate the risk of sourcing material from unacceptable sources within areas of *specified risk.*

NOTE Avoidance of unacceptable sources is always considered an acceptable Control Measure

Direct Purchases: Purchases where there is a *direct relationship with the forest management unit (FMU).* Generally, payment is made directly to the owner of the forest of origin, or there is a direct contractual relationship for those purchases with the owner of the forest or origin.

- Type 1- The Organization has forester design the harvest, or the Organization hires logger
- Type 2 – The Organization has a direct contractual relationship with the landowner (FMU), but the landowner or contract logger delivers wood to the mill

NOTE Direct Purchases are intended to reflect situations where The Organization has the capacity to directly influence activities at the forest management unit (FMU) level.

Indirect purchases: purchases where *there is no direct relationship with the forest management unit (FMU).*

- Type 1 – Wood Supplier system where Supplier purchases wood from landowner and sells logs or chips to the Organization. The Supplier may use a contract logger.
- Type 2 - Wood or chips purchased from a chip mill or wood yard not owned or controlled by the Organization.

- Type 3 - Semi-finished or finished products purchased by the Organization.

Low Risk: A conclusion, following a risk assessment, that there is negligible risk that material from unacceptable sources is sourced from a specific geographic area.

Old Growth: Late-successional forests that were mature at the time of European settlement and the beginning of commercial timber harvesting in a given location, and whose late-successional structural elements and species composition have not been degraded by historic timber harvest. Late successional structures that define old growth usually include high canopy closure, multi-layered, multi-species, dominated by large overstory *legacy* (i.e. pre European settlement) trees, and a high incidence of large snags, trees with broken tops, and very large course woody debris.

- Type 1 Old Growth: Old Growth that qualifies as primary forest. That is, it has never been subject to commercial timber harvest.

- Type 2 Old Growth: Old Growth forest that has been subject to some level of commercial timber harvest, but still contains the structural elements of Old Growth and *legacy* trees.

FM Standard Definition: (1) the oldest seral stage in which a plant community is capable of existing on a site, given the frequency of natural disturbance events, or (2) a very old example of a stand dominated by long-lived early- or mid-seral species The onset of old growth varies by forest community and region. Depending on the frequency and intensity of disturbances, and site conditions, old-growth forest will have different structures, species compositions, and age distributions, and functional capacities than younger forests. Old-growth stands and forests include: **Type 1 Old Growth:** three acres or more that have never been logged and that display old- growth characteristics. **Type 2 Old Growth**: 20 acres that have been logged, but which retain significant old-growth structure and functions.

Primary forest: Forest that has not historically been subject to commercial logging, and has historically been maintained in a forested condition. Forest that has encroached on lands not previously forested is not considered primary. Primary forest includes Type 1 Old Growth.

NOTE Given natural disturbance and successional regimes, stands of any age or successional stage may qualify as primary forest. For example a primary forest does not by definition need to contain an abundance of mature trees.

FM Standard Definition: A forest ecosystem with the principal characteristics and key elements of native ecosystems, such as complexity, structure, diversity, an abundance of mature trees, and that is relatively undisturbed by human activity. Human impacts in such forest areas have normally been limited to low levels of hunting, fishing, and very limited harvesting of forest products. Such ecosystems are also referred to as "mature," "old growth," or "virgin" forests. See also old growth.

Specified Risk: A conclusion, following a risk assessment, that there is a certain risk that forest products from unacceptable sources may be sourced or enter the supply chain from a specific geographic area. The nature and extent of this risk is specified for the purpose of defining efficient *control measures.*

Unacceptable Sources: Sources of material that do not meet the requirements of FSC standards and/or Controlled Wood categories.

Stakeholder Portal: A database maintained by FSC-US that contains known, specific, stakeholder concerns as they relate to the Controlled Wood categories of risk. The Stakeholder Portal is provided to inform the Due Diligence System (DDS) for areas of *low risk*.

IX. ANNEX A. Documenting the Supply Area

Guidance on "supply area"

For the conterminous United States, the term "*supply area*" as used in FSC-STD-40-005 refers to the geographic area from which all inputs subject to the Controlled Wood National Risk Assessment have originated. It does not need to be a single contiguous area and it may refer to an ecoregional, political, or other delineation, or a combination of these delineations. The choice of political or ecoregional delineations is at the discretion of the Certificate Holder.

There is no specific requirement for all inputs to be traceable to the FMU level.

Guidance on the role of supplier declarations

FSC-STD-40-005 states, "*NOTE: A declaration from the supplier may only be used as a part of the body of documentation for demonstrating the supply area. A supplier declaration alone, even if covered by a contractual agreement, is not considered sufficient proof of the supply area*." It remains that supplier declarations can play a role, even a central role, in the body of evidence that can be submitted to a Certification Body for demonstration of a supply area. They must, however, be submitted in conjunction with additional documented evidence supporting claims of supply area. The supply area options below involve supplier declarations, but also require additional evidence.

Requirements for documenting a supply area

Certificate Holders have *three sets of documentation options* that they can use to demonstrate a supply area for Controlled Wood inputs:

OPTION 1

The Certificate Holder can demonstrate supply area through any one of the following sub-options:

a) The Certificate Holder maintains invoices, transportation documents, and/or purchase contracts from either the forest of origin (i.e., log supplier), or that denote the source supply area as defined above (e.g. county, state, province) where these documents can be verified as legitimate and legal; OR

b) The Certificate Holder identifies timber marks (or other origin marks) on the input materials that confirm the forest of origin; OR

c) In cases where relevant records demonstrating forest of origin (as listed in 1.a. above) exist but are not maintained directly by the Certificate Holder, the Certificate Holder can secure a supplier declaration stating the supply area of inputs along with a supplier agreement to make relevant records demonstrating the supply area available to the Certificate Holder and the Certification Body (CB). This option must include sampling and verification of the records by the Certificate Holder on a basis defined by the Certificate Holder and approved by the CB. This is followed by CB review of the sampling and verification protocol and inspection of record samples during annual audits of the Certificate Holder; OR

d) In situations where relevant records demonstrating forest of origin exist, but a supplier does not make these records available to the Certificate Holder, the CB can conduct sampling and verification of records held by suppliers. In this option, the Certificate Holder must secure a supplier declaration stating the supply area of inputs and a supplier agreement to make relevant records demonstrating the supply area available to the CB. This is followed by CB sampling and verification of such records during annual audits of the Certificate Holder.

OPTION 2

The Certificate Holder has the option to demonstrate supply area through BOTH:

a) Demonstrating that all wood received at the log buyer facility is from an area within the stated supply area, via EITHER

   i. Obtaining original log supplier shipping documents denoting source supply area as defined above (e.g. county, state, province); OR

   ii. Securing a signed declaration from the original log buyer (primary manufacturer/concentration yard) that confirms the supply area for all wood received at the log buyer facility in terms of a defined sourcing area from the facility, including EITHER:

      1. Sampling field audits of the forest management units (FMUs) of origin with signed supporting documentation identifying the date, forest, personnel interviewed, and authorization of the signatures (the sampling protocol, established by the Certificate Holder and verified by the CB, may reflect case-specific conditions); OR

      2. Assessment of the logical supply area of the log buyer, including the economically feasible hauling radius of the log buyer, which incorporates the value of the material.

b) Demonstrating the location of the original log buyers (i.e. primary manufacturer or log concentration yard purchasing from log suppliers), via EITHER

   iii. Invoices or transportation documentation issued by primary manufacturers and log concentration yard companies (i.e. log buyers) that sourced the material from the forest; OR

   iv. Original log buyer labels attached to the input material that verifies the primary manufacturer/concentration yard.

OPTION 3

The Certificate Holder may demonstrate the supply area through assessment of the biological range for input species that are endemic to a distinct forest area. A recommended source for biological range of timber species of North America (maps included) is: *Silvics of North America* – available at http://www.na.fs.fed.us/spfo/pubs/silvics_manual/table_of_contents.htm (*Burns, Russell M., and Barbara H. Honkala, tech. coords. 1990. Silvics of North America: 1. Conifers; 2. Hardwoods. Agriculture Handbook 654. U.S. Department of Agriculture, Forest Service, Washington, DC. vol.2, 877 p.*).

Part II – High Conservation Value (HCV) Risk Assessment and Control Measures

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I. Introduction and Summary

FSC US engaged The Nature Conservancy (TNC) to conduct a project to identify High Conservation Values (HCVs). Joe Fargione, TNC Science Director for the North America Region, led the data review and developed a web-based map to identify HCVs. Using that analysis in conjunction with expert consultation and discussion among the Controlled Wood Working Group (CWWG) members, determinations of risk were made for HCVs 1- 6 based on the thresholds and guidance provided in the National Risk Assessment Framework (FSC-PRO-60-002a).

The FSC US Controlled Wood Working Group agreed to generally align the concept of HCV as applied in Controlled Wood to the HCV concept as applied in FSC Forest Management certification. Elements of the FSC US FM standard are therefore used as guidance, including Principle 9, Annex F, and the draft HCV Framework. HCV definitions from the FSC-US FM Standard as well as HCV definitions from the National Risk Assessment Framework (NRAF; FSC-PRO-60-002a) are included in Sections 3 - 8 for each HCV type.

HCV identification and conclusions of risk in this Controlled Wood National Risk Assessment do not supersede conclusions of presence or absence of HCVs in the context of FSC Forest Management certification. Organizations conducting HCV assessments for Forest Management Certification are assessed and audited for conformance to the FSC US Forest Management standard independently of this study.

The HCV definitions from the NRAF are:

- **HCV 1 - Species diversity**. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species that are significant at global, regional or national levels.

- **HCV 2 - Landscape-level ecosystems and mosaics**. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- **HCV 3 - Ecosystems and habitats**. Rare, threatened, or endangered ecosystems, habitats or refugia.
- **HCV 4 - Critical ecosystem services**. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
- **HCV 5 - Community needs**. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (e.g., for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.
- **HCV 6 - Cultural values**. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

1.1 Summary of Results

1.1.1 Areas of *low risk*

The CWWG has designated *low risk* wherever *specified risk* has not been designated per this document. The Controlled Wood Due Diligence System (CW-DDS) still requires that known controversial sources in areas of *low risk* are avoided, including for listed Threatened and Endangered species (HCV1), Old Growth (HCV 3), and regionally significant ecosystems (HCV3).

Permanently protected areas are also designated *low risk*. For the purposes of this National Risk Assessment (NRA), the term "permanently protected" refers to GAP 1 and GAP 2 protection status, as defined by the International Union for the Conservation of Nature (IUCN)[1]. GAP Status 1 are areas that have permanent protection from conversion of natural land cover, as well as a mandated management plan in operation that maintains a natural state, including no suppression of natural disturbance. GAP Status 2 are areas having permanent protection from conversion of natural land cover and a mandated management plan in operation that maintains a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance. In the US, examples of GAP Status 1 & 2 include Designated Wilderness and National Parks.

1.1.2 Areas of *specified risk*:

The CWWG has designated *specified risk* to HCVs in the conterminous US as follows:

[1] http://gapanalysis.usgs.gov/blog/iucn-definitions/

- HCV1: Priority habitats within areas identified as *Critical Biodiversity Areas*, based on a rarity-weighted richness index of biodiversity (Precious Heritage dataset).
- HCV1: Areas of known habitat for *Priority Threatened and Endangered Species* as identified by the CWWG and expert consultation.
- HCV2: *Intact Forest Landscapes (IFL)* that are in the Rocky Mountain or Pacific Coast regions, under federal ownership, and are not permanently protected.
- HCV3: *Roadless Areas* defined as USFS Inventoried Roadless Areas and BLM Wilderness Study Areas.
- HCV3: Areas of primary forest and Old Growth forest, that are on publically-owned lands in the Rocky Mountain or Pacific Coast regions, or public and private lands in coast redwood stands, and are not permanently protected.
- HCV3: Areas of *Priority Forest Types* as identified by the CWWG and expert consultation, and based on guidance in Appendix F of the FSC FM standard.

Intact Forest Landscapes, Roadless Areas, and Critical Biodiversity Areas are geographically defined, and are shown in the TNC analysis webmap: http://foreststewardshipcouncil.s3.amazonaws.com/index.html

The other risk designations are regionally defined. FSC Regions are shown in Annex A, below.

1.1.3 Control Measures

For HCV areas identified as *specified risk,* the CWWG has established *control measures* that a FSC Chain of Custody Certificate Holder making Controlled Wood claims must implement to address the identified risk in these areas. *Control measures* may either avoid materials from unwanted sources, or protect the values associated with the HCVs. Specific Control Measures and outcomes are outlined below in Section II, and are detailed in Section IX for each category for which *specified risk* is designated.

II. HCV Risk Assessment Framework[2]

The table below is an overview of the HCV risk designations, justification, and Control Measures. The table is just an overview; explanatory materials for this framework are in Sections III-VIII, below. Control Measures are fully detailed in Section IX.

The HCV definitions from the NRAF are:

- **HCV 1 - Species diversity**. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species that are significant at global, regional or national levels.
- **HCV 2 - Landscape-level ecosystems and mosaics**. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.
- **HCV 3 - Ecosystems and habitats**. Rare, threatened, or endangered ecosystems, habitats or refugia.
- **HCV 4 - Critical ecosystem services**. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
- **HCV 5 - Community needs**. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (e.g., for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.
- **HCV 6 - Cultural values**. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

Guidance	Threshold	Sources of Information	Risk Justification	Control Measures
3.0 Data available are sufficient for: a) Determination of HCV presence for each HCV, AND b) The assessment of the threats to HCVs from management activities.	'Low risk' thresholds: (1) Data available are sufficient for determination of HCV presence within the area under assessment; AND (2) Data available are sufficient for assessment of threats to HCVs from forest management activities.	Multiple datasets (see below)	***Low risk*** due to the broad availability of research and data in the US	N/A

[2] Thresholds and Guidance established in the National Risk Assessment Framework, FSC PRO-60-002a

Are there data available, sufficient for determination of HCV presence and distribution within the area under assessment, according to the requirements of this document? Are there data available, sufficient for assessment of the threats to HCVs from forest management activities according to the requirements of this document?	'Specified risk' thresholds: (3) Data available are not sufficient for determination of HCV presence within the area under assessment; AND/OR (4) Data available are not sufficient for assessment of the threats to HCVs from forest management activities.			
3.1 – HCV1 (Species Diversity) Does the area under assessment contain HCV 1? Does area under assessment contain or may contain (using a precautionary approach22) critical temporal, seasonal, or ephemeral habitats/resources such as sites for roosting, breeding, hibernation, shelter and migration? Is HCV 1 threatened by management activities? The following threats shall be considered: 1. Habitat removal 2. Habitat fragmentation 3. Introduction of alien / invasive species Is the country signatory to the Convention on Biological Diversity (CBD) and are the CBD targets met? (Refer to Category 1 assessment). Are there any effective protection schemes covering areas with concentrations of biological diversity? Can threats caused by management activities be effectively managed using management tools (e.g. application of best practices)? In the absence of certainty of HCV 1 locations, are there tools available that allow to identify HCV1 while respecting precautionary approach?	'Low risk' thresholds: (5) There is no HCV 1 and its occurrence is unlikely in the area under assessment; OR (6) There is no threat to HCV 1 from management activities; OR (7) HCV 1 is present and/or its occurrence is likely in the area under assessment, but the areas are effectively protected from threats from management activities. 'Specified risk' thresholds: (8) HCV 1 is identified and/or its occurrence is likely in the area under assessment and it is threatened by management activities.	Datasets considered: Critical Habitat (Terrestrial, and Aquatic by stream & HUC10) Aquatic Species Hotspots TNC / NatureServe Biodiversity Dataset Threatened & Endangered Species Occurrence Data	***Specified risk***: Identified *Priority T&E species* and their habitat Priority habitats within *Critical Biodiversity Areas*	Control measures for specific species and habitats are detailed in Section IX
3.2 – HCV2 (Landscape-level ecosystems & mosaics)	'Low risk' thresholds: (9) There is no HCV 2 in the area under assessment and their	Datasets considered:	***Specified Risk***:	Material from Intact Forest Landscapes is

Is HCV 2 present in the area under assessment? To determine presence of HCV 2, follow HCVCG. All Intact Forest Landscapes (IFL) shall be considered as HCV 2. NRA may identify additional HCV 2 provided there is agreement from all NRA-WG chambers. Are HCV 2 areas crossing regional and or national boundaries? Is there an FSC risk designation available for parts located outside of national boundaries? Is HCV 2 threatened by management activities? The following threats shall be considered: 1. Fragmentation, including access (roading), 2. Logging (applies to IFL)	occurrence is unlikely; OR (10) There is no threat to HCV 2 in the area under assessment from management activities; OR (11) HCV 2 is identified and/or its occurrence is likely in the area under assessment, but they are effectively protected from threats by management activities. 'Specified risk' thresholds: (12) HCV 2 is identified and/or its occurrence is likely in the area under assessment, and there are threatened by management activities. NOTE: logging occurring in IFL meets the 'specified risk' threshold.	Northwest Forest Plan land use designations Intact Forest Landscapes TNC Matrix Forest Blocks	Identified Intact Forest Landscapes (IFL) on federal lands in the western US that are not permanently protected	avoided
3.3 - HCV3 (Ecosystems & Habitats) Which nationally/regionally systematized ecosystems are considered HCV 3? Are there any national/regional protection schemes that can be used for assessing HCV presence and threats to them? (As an example, Nature 2000 protection may be considered at European level). Is HCV 3 threatened by forest management activities? The following threat shall be considered: Lack of effective protection of HCV 3. Is there progress in achieving Aichi targets in the area under assessment?	Low risk' thresholds: (13) There is no HCV 3 and its occurrence is unlikely in the area under assessment; OR (14) There are no threats to HCV 3 in the area under assessment from management activities; OR (15) HCV 3 is identified and/or its occurrence is likely in the area under assessment, but areas are effectively protected from threats by management activities, OR (16) There is documented progress in achieving Aichi biodiversity targets23 relevant for the area under assessment confirming that these targets will be met in OR Aichi targets are met. 'Specified risk' thresholds: (17) HCV 3 is identified and/or its occurrence is likely in the area under assessment and there are threatened by forest management activities; AND/OR (18) There is no progress in achieving Aichi biodiversity	<u>Datasets considered:</u> Roadless Remoteness Under-represented Late Succession Forest Late Succession Reserves Northern CA Late Seral Northwest Late Seral Klamath-Siskiyou Southern Appalachian NF Potential Old	***Specified Risk***: Roadless Areas defined as USFS Inventoried Roadless Areas & BLM Wilderness Study Areas Priority Forest Types Primary forest and Old Growth (Type 1 & 2) on public lands in the western US, and on public and private lands in coast redwood stands.	Material is avoided from roadless areas, primary forest, and primary (Type 1) Old Growth Material is avoided that functionally degrades Type 2 Old Growth (i.e. non-primary Old Growth) Control Measures are implemented in Priority Forest Types per Section IX

	targets23	Growth FSC US FM Standar**d**		
3.4 – HCV4 (Critical Ecosystem Services) Is HCV 4 present in the area under assessment? Are there forest areas present in the region that include extensive floodplain or wetland forests that are critical to mediating flooding or for controlling stream flow regulation and water quality? Are there effective management tools and/ or regulations capable of ensuring that these forest areas can continue to perform their functions?	'Low risk' thresholds: (19) There is no HCV 4 and its occurrence is unlikely in the area under assessment; OR (20) There is no threat to HCV 4 present in the area under assessment from management activities; OR (21) HCV 4 is identified and/or its occurrence is likely in the area under assessment, but they are effectively protected from threats by management activities.	Datasets considered: Importance for Drinking Water Provision	***Low Risk*** Drinking water and other critical ecosystem services are broadly and generally protected in the US	N/A
3.5 – HCV 5 (Community needs) Is HCV 5 present in the area under assessment? Is HCV 5 threatened by forest management activities? The following threat(s) shall be considered: The compromising (impacting) of fundamental needs of local communities by management activities. To assess threat please refer to the legality assessment in order to assess whether community rights are legally recognized and are enforced.	'Low risk' thresholds: (23) There is no HCV 5, and its occurrence is unlikely in the area under assessment; OR (24) There is no threat to HCV 5 present in the area under assessment from management activities; OR (25) HCV 5 is identified and/or its occurrence is likely in the area under assessment, but it is effectively protected from threats by management activities. 'Specified risk' thresholds: (26) HCV 5 is identified and/or its occurrence is likely in the area under assessment and there are threatened by management activities.		***Low Risk*** No HCV 5 and its occurrence is unlikely in the area under assessment (Threshold 23)	N/A
3.6 – HCV 6 (Cultural values) Is HCV 6 present in the area under assessment? Have significant cultural features created intentionally by humans been identified? Are outstanding natural landscapes present that have evolved as a result of social, economic,	'Low risk' thresholds: (27) There is no HCV 6, and its occurrence is unlikely in the area under assessment; OR (28) There is no threat to HCV 6 in the area under assessment from management activities; OR (29) HCV 6 is identified	Datasets considered: Federal Regulations	***Low Risk*** Low Risk based on broad and generally effective protection of HCV 6 in the US	N/A

administrative, and/or religious imperative? Have sufficient buffers been applied for cultural values when needed? Is HCV 6 threatened by forest management activities? Following threat shall be considered: Destruction and / or disturbance of rights/ values determining HCV 6 presence. To assess threat please refer to the legality assessment in order to assess whether community rights are legally recognized and are enforced.	and/or its occurrence is likely in the area under assessment, but it is effectively protected from threats by management activities. 'Specified risk' thresholds: (30) HCV 6 is identified and/or its occurrence is likely in the area under assessment and there are threatened by management activities.		legal system	

III. Explanatory Materials for the Framework – HCV 1

3.1 HCV1 Definition and Guidance

NRAF HCV 1 Definition: Species Diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species that are significant at global, regional or national levels.

FSC-US FM HCV 1 Definition: HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia). HCV1 includes RTE species.

Additional information from HCV Common Guidance (Proforest[3]):

Any area that contains significant concentrations of HCV 1 species (RTE or endemic), or which contains habitat critical to the survival of these species will be an HCV area. It does not mean that any sighting or recorded presence of a RTE species would qualify as HCV, only where the concentration of species is globally, regionally or nationally significant. Remember, these non-HCV values can still be protected under other environmental management principles.

It is not necessarily important to have a certain amount of biological diversity to qualify as an HCV 1; even a single species can be considered important enough to be an HCV 1 on its own if the species is, for example, listed in the IUCN Red List or on the National Protected Species list and is found in a population large enough to qualify as a significant concentration in the country in question.

The following qualify as HCV 1:

- *A high overall species richness, diversity or uniqueness within a defined area when compared with other sites within the same biogeographic area.*
- *Populations of multiple endemic or RTE species.*
- *Important populations or a great abundance of individual endemic or RTE species, representing a substantial proportion of the regional, national or global population which are needed to maintain viable populations either:*
    - *Year-round (e.g. key habitat for a specific species) or,*
    - *Seasonally, including migratory corridors, sites for breeding, roosting or hibernation, or refuges from disturbance.*
- *Small populations of individual endemic or RTE species, in cases where the national, regional or global survival of that species is critically dependent on the area in question (such species are likely to be restricted to a few remaining areas of habitat, and to be classified as EN or CR on the IUCN Red List). In these cases, there is often consensus (among many stakeholders) that every surviving individual is globally significant (e.g. flagship species such as Panda, Indian Rhino, Mountain Gorilla).*
- *Sites with significant RTE species richness, or populations (including temporary concentrations) of priority species approaching those of key protected areas or other priority sites within the same biogeographic boundary.*

[3] Brown, E., N. Dudley, A. Lindhe, D.R. Muhtaman, C. Stewart, and T. Synnott (eds.). 2013 (October). Common guidance for the identification of High Conservation Values. HCV Resource Network. P.25 http://www.proforest.net/publication-objects/common-guidance-for-the-identification-of-high-conservation-values

- *Particularly important genetic variants, subspecies or varieties. For example, the Cross River gorilla (*Gorilla gorilla diehli*, ca. 250 individuals remaining) is a genetically distinct subspecies of Western gorilla (*Gorilla gorilla*, ca. 95,000 individuals worldwide).*

3.2 Identification of HCV 1 in the US

3.2.1 Datasets and other sources of information

3.2.1.1 Critical Biodiversity Areas

This study is a species richness index published by Natureserve and The Nature Conservancy that identifies areas with high concentrations of rare species[4]. The study identifies concentrations of biodiversity based on occurrence data from Natureserve of 2,800 rare species in the US. The index preferences species with limited ranges by applying an additional weighting to species that is proportionate to the size of the species' range (rarity-weighted richness index). The value assigned to any specific area is the sum of the species present (i.e. species richness) incorporating the rarity of each species.

This study aligns well with HCV 1 definition of concentrations of biological diversity including endemic species, and rare, threatened or endangered (RTE) species. While this index is influenced by non-forest species, in areas that are predominately forested or forest matrix it should be representative of biodiversity per HCV 1.

The CWWG agreed to use the TNC Critical Biodiversity Areas map to identify areas of HCV 1 based on a richness index threshold that represents known areas of high biodiversity, as discussed in the TNC HCV study (Annex B). Areas were omitted where they do not represent forest-associated biodiversity (e.g. southern Nevada), where timber production is very limited and not likely to affect landscape-scale values (e.g. Utah), or where the vast majority of the forested land within the biodiversity area is protected (e.g. the Everglades). Within identified Critical Biodiversity Areas, a list of priority habitats was developed through expert consultation that represent those biodiversity values.

3.2.1.2 Expert Consultation

Priority T&E Species and priority habitats within identified Critical Biodiversity Areas were identified in part through consultation with regional experts. Priority habitats in Critical Biodiversity Areas were selected based on the habitat types that were determined to representative of the biodiversity associated with the area.

QUESTION FOR CONSULTATION: The development of Priority T&E species and priority habitats that represent Critical Biodiversity Areas is an ongoing process that will benefit from information provided during the public consultation. Please provide information on the appropriateness of the list below in relation to the biodiversity of each identified area you are expertly familiar with.

[4] Published as part of: *Precious Heritage: The Status of Biodiversity in the United States* Edited by Bruce A. Stein, Lynn S. Kutner, and Jonathan S. Adams Oxford University Press. Published March 2000. 416 pages;

3.2.1.3 Priority T&E Species Criteria

A list of Priority Threatened and Endangered species was developed based on criteria established by the CWWG and the HCV 1 guidance above. The criteria are:

- State or Federally-listed Threatened or Endangered species
- Vertebrates
- Commonly recognized as being a keystone species, indicator species, or otherwise representative of a given forested landscape
- Global Rarity
- Forest-dependent
- Directly affected by forest practices

3.2.1.4 Additional Datasets Considered

Additional datasets were considered but ultimately not included in the analysis of HCV 1. See Annex B for additional information. The datasets considered but not included are:

- Threatened & Endangered Species Occurrence Data. T&E species occurrence data compiled by Natureserve or other Natural Heritage initiatives
- Critical Habitat (Terrestrial, and Aquatic by stream & HUC10). Critical habitat is an official federal designation for threatened & endangered species. It has not been designated for all threatened and endangered species. Critical Habitat restrictions only apply to federally funded projects and lands.
- Aquatic Species Hotspots. Identifies watersheds that contain at risk freshwater fish and mussel species. Published by Natureserve in the "Rivers of Life" report[5].

3.3 Risk Designation and Justification:

NOTE Control Measures associated with these *specified risk* designations are in Section IX.

3.3.1 Identified priority habitats in Critical Biodiversity Areas

The US is *specified risk* for the following habitats in Critical Biodiversity Areas.

NOTE These Critical Biodiversity Areas are geographically defined by the TNC webmap: http://foreststewardshipcouncil.s3.amazonaws.com/index.html

Central California:

- Sierra Nevada mixed conifer stands: The Sierra Nevada hosts a wide variety of biodiversity including hundreds of vertebrates, rare species, and endemic plants. Biodiversity in the forested areas of this part of the California Floristic Province is dependent on a diversity of stand types

[5] http://www.natureserve.org/library/riversoflife.pdf

and ages, including species diversity of trees, forest openings, and standing and downed woody structure. Potential threats to the biodiversity include conversion to mondominant stands and removal of old growth.

- California Coastal Prairies and Montane Meadows: The California Floristic Province is recognized by many international conservation organizations as a globally recognized center of biodiversity. The Coastal Prairies and Montane Meadows of this part of California host exceptional biodiversity and provide key habitat needs for many endangered plant and animal species. These values have been threatened by altered fire regimes, grazing practices, and a lack of management that can result in invasion by coniferous tree species that reduce the biodiversity values of these grasslands.

Klamath-Siskiyou:

- Mixed conifers stands: The biodiversity in the Klamath-Siskiyou ecoregion is driven by geologic, topographic, and climatic complexity. This diversity in the geophysical landscape promotes a diversity of forest and other ecosystem types. Forest-based biodiversity in the Klamath-Siskiyou is largely sustained in diverse mixed conifer stands adapted to low-mid fire severity and frequency. Structural changes due to altered fire regimes and conversion to monodominant stands for timber production may threaten these biodiversity values.

Southern Appalachians:

- Aquatic habitats: Biodiversity values in the southern Appalachians are largely driven by exceptional aquatic biodiversity that includes fish, mussels, snails, crayfish, and amphibians. The Cahaba River watershed is the center of the biodiversity hotspot, but the biodiversity area includes other smaller watercourses as well. Biodiversity is potentially threatened by sedimentation from roads.
- Glades: Bibb County Glades (i.e. rock outcrops), exposed limestone glades, and sandstone glades in Central Alabama have high density of rare plants. These biodiversity values are potentially harmed by logging and other management activities that may not recognize the values associated with glades.
- Montane longleaf pine: Montane longleaf pine habitats occur in steep rolling topography historically maintained by fire, mostly outside of or on the edge of the Coastal Plain. Biodiversity values are driven in part by the understory plant community. Biodiversity values are potentially harmed via conversion of longleaf to other pine types, and the use of herbicides or other management techniques that inhibit native understory communities.

Florida Panhandle:

- Longleaf pine habitats: Site conditions and conservation concerns similar to montane longleaf pine, above.
- Apalachicola Bay / river system: Biodiversity values within the Apalachicola bay system are driven by reptiles, amphibians, and mussels. Biodiversity values are centered on the area where the Chattahoochee River meets the Flint River and form the Apalachicola River. Biodiversity is

potentially threatened from sedimentation of the river system, including from forest management activities.

- Steephead ravines along Apalachicola river system: Steephead Ravines along the Apalachicola River system contain a wide diversity of species including RTE species, due largely to the heterogeneity of site conditions and microclimates. They also harbor the southernmost range of many northern species.

Central Florida:

- Pine Flatwoods: As in other areas of the southern US, biodiversity is driven in part by native pine ecosystems. Pine flatwoods are also associated with xeric uplands / sandhills that provide a range of biodiversity values, including native plant diversity.

Cape Fear Arch:

- Pocosins / Carolina bays: Pocosins are shallow depressions that support palustrine wetlands on the coastal plains of the Carolinas, which in turn harbor rare native plant diversity like the venus fly trap. They generally have a pine overstory and are regularly associated with longleaf pine. Some stakeholder perspective that "shovel-logging" of these mesic sites may result in undesirable regeneration.

Ouachita River Valley:

- Aquatic habitats: Biodiversity in the Ouachita headwaters is largely driven by freshwater biodiversity. Many BMPs in the region are voluntary, and higher implementation rates are a straightforward way to enhance aquatic biodiversity values.

Central Appalachians:

- Karst Habitats: There are numerous areas of high aquatic and terrestrial biodiversity in the karst habitats of the Appalachians. The aquatic resources include fresh water mussels, fish, and insects. The karst systems are rich with endemic and globally rare fishes, insects, and cave invertebrates. The Clinch, Powell, and Duck rivers are just a few of the nationally important river systems in the region. Sedimentation from poor logging practices and improperly constructed and maintained roads are the primary potential forestry-related threats.

QUESTION FOR CONSULTATION: These priority habitats in Critical Biodiversity Areas are inherently value driven, and are in part based on stakeholder input. Does the above list 1) accurately reflect the most appropriate ecosystems that represent the biodiversity of each identified biodiversity area, and 2) are the associated Control Measures in Section IX appropriate?

3.3.2 Identified Priority Threatened and Endangered Species

The US is *specified risk* for the following habitats associated with *Priority Threatened and Endangered Species*:

- Red-cockaded Woodpecker: Red-cockaded woodpeckers nest in cavities of living pine trees in the southeastern US. They are dependent on pine woodlands and savannas that have pine trees large enough to provide nesting habitat. They will nest in all southern yellow pines but preference longleaf pine. For foraging habitat, they require mature open woodlands with abundant herbaceous groundcover.
- Gopher Tortoise: Gopher tortoise is a keystone species native to longleaf pine forests of the southeastern US, and is listed as threatened in the western part of its range. Gopher tortoises are threatened by development pressure on their habitat. Conservation of longleaf pine habitats is a primary recovery strategy for the gopher tortoise.
- Northern Spotted Owl: Northern Spotted owls are dependent on late successional forests of the Pacific Northwest. They utilize complex foraging habitat with a preference for late successional stands, and nest in structurally complex old growth habitats.
- Marbled Murrelet: The Marbled Murrelet is a seabird native to the Pacific Coast that nests in late successional stands. The primary threat to Marbled Murrelet is loss of suitable nesting habitat in late successional coastal forests. They nest in old growth stands, or mature stands with old growth characteristics, that have trees larger than 30" dbh.
- Listed Anadromous Salmonids: Multiple distinct runs of five salmonid species are listed under the ESA in the Pacific Northwest (i.e. salmon and steelhead trout). All listed runs depend on clear, cold, and clean spawning habitats in headwater streams. Forest management can have substantial impacts on the quality of these headwater habitats.
- Kirtland's Warbler: Kirtland's warbler are migratory birds that nest in the lake states in mid-seral Jack Pine stands. They nest primarily in the northern portion of the lower peninsula of Michigan. Specifically, Kirtland's Warbler are dependent on Jack Pine stands 5-20 feet tall (6-22 years old) with abundant understory.

QUESTION FOR CONSULTATION: These Priority T&E species and associated Control Measures are inherently value driven, and are in part based on stakeholder input. Does the above list 1) accurately reflect the most appropriate species given the criteria in 3.2.1.3, and 2) are the Control Measures in Section IX appropriate?

IV. Explanatory Materials for the Framework – HCV 2

4.1 HCV 2 Definition and Guidance

NRAF HCV 2 Definition: Landscape-level ecosystems and mosaics. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

FSC-US FM HCV 2 Definition: HCV forest areas containing globally, regionally or nationally 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.

Additional information from HCV Common Guidance (Proforest[3]):

Large areas (e.g. could be greater than 50,000 ha, but this is not a rule) that are relatively far from human settlement, roads or other access. Especially if they are among the largest such areas in a particular country or region.

- *Smaller areas that provide key landscape functions such as connectivity and buffering (e.g. protected area buffer zone or a corridor linking protected areas or high quality habitat together). These smaller areas are only considered HCV 2 if they have a role in maintaining larger areas in the wider landscape.*
- *Large areas that are more natural and intact than most other such areas and which provide habitats of top predators or species with large range requirements.*

4.2 Identification of HCV2 in the US

4.2.1 Datasets and other sources of information

4.2.1.1 Greenpeace/ WRI Intact Forest Landscapes[6]

An Intact Forest Landscape (IFL) is an unbroken expanse of natural ecosystems within the zone of current forest extent, showing no signs of significant human activity, and large enough that all native biodiversity, including viable populations of wide-ranging species, could be maintained[4]. According to the TNC analysis, the Greenpeace / WRI IFL dataset is very robust given that it is relatively straightforward to identify intact forest using remote sensing.

In the eastern US, IFL only occur in three protected areas: within the Adirondack management area in upstate New York, in the Okefenokee National Wildlife Refuge in southeastern Georgia, and in the Everglades on the southern tip of Florida. In the western US, IFL occurs largely in GAP 1 & 2 protected areas, but also occurs outside of these protected areas. Where there is IFL not in GAP 1 or 2 protection status, it is generally on federal lands managed by the US Forest Service and other agencies (GAP 3).

4.2.1.2 Additional Datasets Considered

Additional datasets were considered but ultimately not included in the analysis of HCV 1. See Annex B for additional information. The datasets considered but not included are:

- TNC Matrix Forest Blocks[7]. Dataset developed by TNC for forest matrix in the eastern US. Forest matrixes in this context "are large contiguous areas whose size and natural condition allow for the maintenance of ecological processes, viable occurrences of matrix forest communities, embedded large and small patch communities, and embedded species populations."[5] This datalayer was not used because it was determined by the CWWG that it does not fit the full definition of HCV 2, and the dataset only covers a limited section of the eastern US.

[6] 2014. Greenpeace, WRI, UMD, WWF. http://www.intactforests.org
[7] http://databasin.org/datasets/68c240fb9dc14fda8ccd965064fb3321

- Northwest Forest Plan Land Use Allocation[8]. Several datalayers map the different management areas associated with the Northwest Forest Plan, which is a series of federal policies and guidelines for managing federally owned forest land in the Pacific Northwest. These data were not included because they do not fit the full definition of HCV 2 as determined by the CWWG, and are limited to public lands.

4.3 Risk Designation and Justification

The US is Specified Risk for HCV 2 in the following areas:

- Identified Greenpeace/WRI Intact Forest Landscapes (IFL) that are on federal ownership, west of the Mississippi River, and that are outside of GAP 1 or GAP 2 protected areas.

NOTE The Greenpeace IFL datalayer is shown in the TNC report webmap: http://foreststewardshipcouncil.s3.amazonaws.com/index.html

V. Explanatory Materials for the Framework – HCV 3

5.1 HCV 3 Definition and Guidance

NRAF HCV 3 Definition: Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.

FSC-US FM HCV 3 Definition: HCV forest areas that are in or contain rare, threatened or endangered ecosystems. HCV 3 includes: old growth, roadless areas greater than 500 acres or that have unique attributes, and primary forests.

Additional information from HCV Common Guidance (Proforest[3]):

Naturally rare because they depend on highly localized soil types, locations, hydrology or other climatic or physical features, such as some types of limestone karst forests, inselbergs, montane forest, or riverine forests in arid zones.

- *Anthropogenically rare, because the extent of the ecosystem has been greatly reduced by human activities compared to their historic extent, such as natural seasonally flooded grasslands on rich soils, or fragments of primary forests in regions where almost all primary forests have been eliminated.*
- *Threatened or endangered (e.g. rapidly declining) due to current or proposed operations.*
- *Classified as threatened in national or international systems (such as the IUCN Red List of Ecosystems)*

5.2 Identification of HCV3 in the US

5.2.1 Datasets and other sources of information

5.2.1.1 HCV 3 Examples from the FSC US National Standard

[8] http://databasin.org/datasets/5570316b9f174178a652136bac47ae4c

The FSC-US Forest Management (FM) Standard includes a list of regionally important ecosystems in Annex F of that standard. These were developed as examples for landowners conducting HCV assessments under the FM Standard. They do not fit the definition of HCV 3 as used in Controlled Wood in all cases, and the list is not comprehensive. For example, no list of ecosystems was developed for the southeastern US. Additionally, not all of these ecosystems are likely to be directly and negatively affected by harvest and other forest management activities. They are therefore not considered a definitive list, but are useful as guidance for HCV 3 identification with respect to Controlled Wood.

NOTE Many of the ecosystems listed in the FM Standard and other also qualify under "Old Growth," which is considered separately in this HCV analysis.

5.2.1.2 Expert Consultation

In addition to the HCV examples from the US FM Standard, regional experts were consulted to develop a list of Priority Forest Types.

QUESTION FOR CONSULTATION: As with the expert consultation in Section 3.2.1.2, this is an ongoing process that will be dependent in part on feedback from the public consultation. Please provide information on the appropriateness of the list below in relation to areas you are expertly familiar with.

5.2.1.3 Late Successional Layers (multiple data sources)

Late successional (Old Growth) layers considered in this analysis include:

- Possible Old Growth on National Forest Land in the Southern Appalachians (Southern Appalachians Assessment: Terrestrial Resources Technical Report. 1996; http://www.samab.org/site/publications/).
- Late seral forest on private lands for the Klamath-Siskiyou ecoregion (Conservation Biology Institute, 2002; http://databasin.org/datasets/806a5cf3afc04778a6aa34725a757857).
- Coastal Temperate Rainforest - Remaining Late Seral Forest Fragments in Northwest North America (Ecotrust, Pacific GIS, & Conservation International, 1995; http://databasin.org/datasets/7f72a68ac6c343bda3ffff4bef3926de).
- Northern California (USA) U.S. Forest Service Late-Successional Reserves (USFS 2003, http://databasin.org/datasets/e12f559cda4743b1b76cc8715bcd677a).

All of these datalayers have similar characteristics and can be treated as a group. They are all based on remote sensing data and demonstrate an increased likelihood of late successional forest. They are not spatially explicit maps of late successional forest.

5.2.1.4 Roadless Areas Datalayer

The roadless area datalayer incorporates US Forest Service (USFS) Inventoried Roadless Areas and Wilderness Study Areas (USFS & BLM). These are public lands with special designations based on their roadless character. They therefore fit well within the definition of HCV 3.

5.2.1.5 Additional Datasets Considered

Additional datasets were considered but ultimately not included in the analysis of HCV 3. See Annex B for additional information. The datasets considered but not included are:

- Remoteness: A datalayer developed by TNC that is based on distance from known roads, with slope as an additional variable as a proxy for inaccessibility. This layer has a very high correlation with Gap 1 & 2 protected areas, and roadless areas. The CWWG determined that the HCVs associated with this datalayer are already addressed via protected areas and roadless areas.

5.3 Risk Designation and Justification

5.3.1 Primary Forest

The CWWG determined that primary forest has a high enough likelihood of occurrence outside of protected areas to designate *specified risk* on public lands in the Pacific Coast and Rocky Mountain regions.

For the purposes of this Controlled Wood National Risk Assessment, primary forest is a stand that has not historically been subject to commercial logging, and has historically been maintained in a forested condition. Forest that has encroached on lands not previously forested, including grasslands and meadows, is not considered primary. Primary forest includes Type 1 Old Growth. Given natural disturbance and successional regimes, stands of any age or successional stage may qualify as primary forest. For example a primary forest does not by definition need to contain an abundance of mature trees.

5.3.2 Old Growth

Based on the Old Growth datalayers, the CWWG determined that Old Growth has a high enough likelihood of occurrence outside of permanently protected areas to designate *specified risk* on public lands in the Pacific Coast and Rocky Mountain regions.

Risk is specified for Old Growth on publically owned lands in the Pacific Coast and Rocky Mountain regions that are not permanently protected, as well as on both public and private lands when sourcing redwood (*Sequoia sempervirens*). This includes both Type 1 Old Growth (i.e. primary or unentered) and Type 2 Old Growth (i.e. structurally intact).

For the sake of the Controlled Wood National Risk Assessment, “Old Growth” refers to late-successional forests that fit the FM definition of Old Growth, *and are pre-colonial in nature*. That is, the current forest

cover was already mature at the time of European settlement and the beginning of commercial logging in that given area.

QUESTION FOR CONSULTATION: There is stakeholder perspective that due to the high conservation value of redwood forests and their associated ecosystems, and a likelihood of late successional stands on private lands in the region, this Old Growth risk designations should apply to private lands as well as public in the redwood region.

- Should Old Growth protections apply to private lands (as well as public) in the redwood region?
- If so, should these protections apply only when sourcing material from redwood trees (*Sequoia sempervirens*), or material from all tree species?

5.3.3 Priority Forest Types (PFT)

NOTE These PFTs were developed by the CWWG using the FSC US FM list as guidance in addition to the Proforest guidance and additional stakeholder input.

NOTE These PFTs are regionally defined. FSC regions are shown in Annex A.

NOTE Since Old Growth has designated specified risk for the Pacific Coast and Rocky Mountain Regions (see above), potential PFT that are by definition Old Growth (e.g. Old Growth Douglas Fir stands) in those regions were not included here as PFT.

Risk is specified for the following PFTs:

Appalachian

- Mesophytic cove sites: Mesophytic cove sites are diverse, closed-canopy hardwood forest occurring on mesic, sheltered sites (coves). In addition to a very diverse flora, mesophytic coves provide habitat for rare animal species with limited ranges like the cerulean warbler and crevice salamander. The major threat to mesophytic coves is conversion to non-forest uses or other forest types (e.g. white pine).
- Native Spruce-Fir Forests: Comprised of native Red Spruce and Frasier Fir, these habitats occur on Appalachian mountaintops, generally above 4,500 feet in elevation. They are a rare boreal forest type that are isolated from other boreal forest types, and provide necessary habitat to endemic high-elevation species.

Northeast

- Riverbank areas of the St. John's River: The upper St. John river and its associated riparian areas and floodplain provides a variety of vital habitats, including for RTE species, in a generally unfragmented landscape.

Southeast and Mississippi Alluvial Valley

- Late successional bottomland hardwoods: Stand conditions of late successional bottomland hardwoods are extremely diverse and variable, and can be affected by minor changes in hydrology. Woody species diversity is comparable to the most diverse upland forests in the US. Several species groupings are considered bottomland hardwoods including mixed hardwoods and cypress-tupelo. Much of the original bottomland hardwood in the US has been cleared for agriculture, particularly so in the Mississippi valley.

  "Late successional" in this instance refers to bottomland hardwoods that are *at least* 80 years old *and* have the complex structural characteristics and species composition associated with late successional stands.

- Native longleaf pine savanna: Once one of the most widespread forest types in the US, longleaf pine savannah has been reduced to 3% of its original range. Associated with particularly high animal and plant diversity, including RTE species, longleaf pine savanna is responsible in part for the high biodiversity associated with the Central Alabama, Florida Panhandle, and Cape Fear Arch critical biodiversity areas. Longleaf pine savanna is also directly associated with the Red Cockaded Woodpecker and Gopher Tortoise priority T&E species.

  "Native" in this instance refers to longleaf pine that is on a site that has historically been maintained as longleaf pine. Longleaf pine stands that have been restored in areas that have not been historically maintained in longleaf pine do not apply under this section. "Native" does not imply a particular regeneration method; these stands may be either planted or naturally regenerated.

QUESTION FOR CONSULTATION: These Priority Forest Types and associated Control Measures are inherently value-driven, and are based on stakeholder input and the Forest Management list of regionally important ecosystems. Does the above list 1) accurately reflect the most regionally significant ecosystems for each ecoregion, and 2) are the Control Measures in Section IX appropriate?

5.3.4 Roadless Areas

Specified risk is designated in Inventoried Roadless Areas and Wilderness Study Areas as shown in the Roadless datalayer. Under federal law timber harvest is not currently allowed in either of these designations; is designated based on the absence of permanent legal protection for these areas and stakeholder perspectives that they still have the potential to be threatened by extractive activity.

QUESTION FOR CONSULTATION: Should risk also be designated for other roadless areas on federal lands that are greater than 500 ac in size (but are not part of Inventoried Roadless Areas or Wilderness Study Areas)? These areas cannot be reliably mapped due to a lack of sufficient data, but the 500 acre threshold would coincide with the FM definition of HCV 3.

VI. Explanatory Materials for the Framework – HCV 4

6.1 HCV 4 Definition and Guidance

NRAF HCV 4 Definition: Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

FSC-US FM HCV 4 Definition: HCV forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).

Additional information from HCV Common Guidance (Proforest[3]):

An ecosystem service is critical where a disruption of that service poses a threat of severe, catastrophic or cumulative negative impacts on the welfare, health or survival of local communities, on the functioning of important infrastructure (roads, dams, reservoirs, hydroelectric schemes, irrigation systems, buildings, etc.), or on other HCVs.

*The concept of **critical situations** relates to:*

- *Cases where loss of or major damage to an ecosystem service would cause serious prejudice or suffering to recipients of the service either immediately or periodically (e.g. regulation of water provision during critical drought periods), or*
- *Cases where there are no viable, readily available or affordable alternatives (e.g. pumps and wells) that can be relied on if the service fails.*

6.2 Identification of HCV 4 in the US

6.2.1 Datasets and other sources of information

6.2.1.1 USFS Forests to Faucets – Important Areas for Surface Drinking Water[9]

Highlights areas important to drinking water based on the number of people that depend for drinking water on a given watershed (i.e. HUC 12), weighted for distance upstream from the water intake.
This datalayer shows the importance of watersheds in the US to drinking water provision, but it does not provide any information on the quality of forest management in given watersheds.

6.3 Risk Designation and Justification

HCV 4 was determined to be *low risk* by the CWWG relative to other HCV categories. The US has a relatively strong legal system for protecting drinking water as it relates to forest management, including the Clean Water Act and some other federal, state, and local regulations.

[9] http://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml.

Drinking water was the primary HCV 4 identified by the CWWG.

VII. Explanatory Materials for the Framework – HCV 5

7.1 HCV 5 Definition and Guidance

NRAF HCV 5 Definition: Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (e.g., for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.

FSC-US FM HCV 5 Definition: HCV forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health).

HCV 5 includes forest areas that local people use to obtain resources on which they are critically dependent. This may be the case if local people harvest food products from the forest, or collect building materials or medicinal plants where no viable alternative exists. Forest uses such as recreational hunting or commercial timber harvesting (i.e., that is not critical for local building materials) are not basic human needs.

Additional information from HCV Common Guidance (Proforest[3]):

Fundamental for satisfying basic necessities

A site or resource is fundamental for satisfying basic necessities if the services it provides are irreplaceable (i.e. if alternatives are not readily accessible or affordable), and if its loss or damage would cause serious suffering or prejudice to affected stakeholders. Basic necessities in the context of HCV 5 may cover any or all of the provisioning services of the environment… including tangible materials that can be consumed, exchanged or used directly in manufacture, and which form the basis of daily life….

HCV 5 is most likely to be more important in areas where whole communities or significant portions of them are heavily dependent on those ecosystems for their livelihoods, and where there is limited availability of alternatives. In general, if local people derive benefits from natural or traditionally managed ecosystems, HCV 5 may be present.

The following indicate a high likelihood of HCV 5 in the area:

- *Most houses are built from, and household tools made from, locally available traditional/ natural materials,*
- *There is little or no water and electricity infrastructure*
- *Farming and livestock raising are done on a small or subsistence scale*
- *Indigenous hunter-gatherers are present*
- *There is presence of permanent or nomadic pastoralists*
- *Hunting and/or fishing is an important source of protein and income*
- *A wild food resource constitutes a significant part of the diet, either throughout the year or only during critical seasons*

7.2 Risk Designation and Justification

The US was determined to be *low risk* for HCV 5, as determined by the CWWG. The United States is an industrialized nation that does not contain communities within the contiguous continental United States that directly rely on sites or resources fundamental to satisfying basic needs. This includes indigenous peoples.

VIII. Explanatory Materials for the Framework – HCV 6

8.1 HCV 6 Definition and Guidance

NRAF HCV 6 Definition: Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

FSC-US FM HCV 6 Definition: HCV forest areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities). HCV 6 includes areas of cultural significance that have traditional importance to local or indigenous people. These may be religious/sacred sites, burial grounds or sites at which regular traditional ceremonies take place. They may also include outstanding natural landscapes that have evolved as a result of social, economic, administrative, and/or religious imperative (i.e., fossils, artifacts, areas representing a traditional way of life), or areas that by virtue of their natural properties possess significant religious, artistic or cultural association.

Additional information from HCV Common Guidance (Proforest[3]):

The definition of HCV 6 is extremely broad and it is useful to divide it into two different categories: cultural values of global or national significance, and values critical for local people at the site scale.

Values of global or national significance: Sites, resources, habitats or landscapes which are significant at the global or national level are likely to have widely recognized historical, religious or spiritual importance and in many cases will have an official designation by national government or an international agency like UNESCO. Occasionally, new sites or resources of extraordinary cultural significance may be discovered through exploration of sites for development (e.g. ancient burial sites or prehistoric cave art); these can qualify as HCV 6 based on expert and stakeholder opinion, without an official designation.

Critical importance for the traditional cultures of local communities or indigenous peoples: HCV 6 represents areas of cultural significance that have traditional importance to local or indigenous people. These may be religious or sacred sites, burial grounds or sites at which traditional ceremonies take place. These are frequently well known by the local people, and some national laws require them to be identified and protected.

8.2 Identification of HCV 6 in the US

8.2.1 Datasets and other sources of information

HCV 6 in the US are often identified through formal protection in National Monuments or Parks, or in state or local designations. The locations of many other HCV 6 in the US are not publically available in order to protect the HCV. It was not deemed necessary to conduct a spatial analysis of HCV 6 for the sake of the NRA, and no spatial datasets were incorporated.

8.2.1.1 Federal Regulation

Major federal laws in the US that project HCV 6 include:

- **Antiquities Act of 1906:** Placed antiquities under federal protection and created penalties for disturbances of antiquities.
- **National Historic Preservation Act of 1966:** Increased protection of cultural resources beyond Antiquities Act.
- **Archaeological Resources Protection Act of 1979:** Imposed felony-level penalties for the disturbance of antiquities
- **Native American Graves Protection and Repatriation Act of 1990:** Guarantees the rights of lineal descendants to human remains and associated cultural items.
- **Executive Order 13007 of 1996:** Protects and preserves sacred sites and religious practices.
- **Executive Order 13084 of 1998:** Requires federal agencies to consult and coordinate with tribal governments in the protection of cultural resources.

8.3 Risk Designation and Justification

HCV 6 occur throughout the US, but are protected under the federal legal system as outlined above. HCV 6 is therefore designated as *low risk* due to legal protection of the HCV (NRAF threshold #29).

IX. Control Measures

9.1 HCV 1: Priority Threatened and Endangered (T&E) Species and their Habitats

Procurement policies where *Priority T&E Species* exist shall be designed and implemented to avoid harm to the species where they are known to occur through the maintenance of the quality and quantity of necessary habitat features, based on the best available information regarding the species' habitat needs and potential forest management impacts.

NOTE These Control Measures for Priority T&E Species are intended to be implemented where that species is "known to occur," which by definition requires the Organization or supplier to conduct an assessment of that species' occurrence if there is reason to believe it may occur within the supply area. This assessment may comprise a search of relevant databases (e.g. NatureServe or relevant state databases), or

consultation with experts (e.g. company wildlife biologists or state government personnel involved with T&E species management).

QUESTION FOR CONSULTATION: All of these Control Measures associated with priority T&E species are based on supply areas where the species are "known to occur." It is therefore important that Certificate Holders or suppliers look into the presence of species where they may occur.

- Does the above NOTE give sufficient clarity and flexibility around assessing species occurrence?
- Should database searches or expert consultation be a required part of this assessment?

Species specific Control Measures are as follows:

- Red-cockaded Woodpecker: Where Red-cockaded Woodpecker are known to occur, maintain open habitat structure and with mature trees and cavity trees suitable for nesting (dbh >12"). Maintain longleaf pine savanna per Priority Forest Types. Consider participating in Safe Harbor Programs.
- Gopher Tortoise: Maintain native longleaf pine savanna per Priority Forest Type Control Measures. Minimize impact on gopher tortoise habitats, including site prep, where they are known to occur.
- Northern Spotted Owl: Harvest occurs in a manner that maintains large contiguous blocks of late successional forest where NSO are known to occur, including maintenance of habitat heterogeneity and connectivity. Harvest occurs in a manner that maintains net habitat quality and quantity in areas of known occupancy, including retention of known nest sites. Appropriate structural components are retained including large old trees, large snags, and large downed woody debris.

QUESTION FOR CONSULTATION: Habitat requirements for Northern Spotted Owl are complex, including distinctly different structural characteristics necessary for uses and life stages (e.g. nesting, feeding, and dispersal). Does this control measure need to address each habitat type specifically, or does the control measure as written maintain a necessary level of flexibility for suppliers?

- Marbled Murrelet: Harvest occurs in a manner that maintains net habitat quality and quantity across the landscape in areas of known occupancy, including retention of known nest sites. Appropriate structural components are retained including large old trees, large snags, and large downed woody debris.
- Listed Anadromous Salmonids: Wood suppliers shall identify all streams and direct tributaries of streams where anadromous salmonids listed as threatened or endangered in the ESA may be present. In those streams, buffers are created with harvest restrictions that are sufficient to meet water quality standards for sedimentation and temperature, including any applicable basin-level standards, as determined via expert consultation, OR

Wood suppliers shall conduct harvest operations according to the riparian standards set in the FSC-US Forest Management Standard (V1.0) for the appropriate region.

QUESTION FOR CONSULTATION: Should this anadromous salmonids Control Measure require *independent* expert consultation, or is consultation with in-house experts, where they exist, sufficient?

- In either case, should a requirement for reference to the published literature also be included?

- Kirtland's Warbler: In Jack Pine stands in northern Michigan within the rage of Kirtland's Warbler, wood suppliers shall conduct harvest operations in a manner sufficient to maintain the distribution and extent of mid-seral Jack Pine (aged 6-22 years) across the landscape.

9.2 HCV 1: Identified Priority Habitats within Critical Biodiversity Areas

Where regional management plans directed at the conservation Critical Biodiversity Area habitat types have been created, they are used as primary sources for development of management practices.

Habitat-specific Control Measures are as follows:

Central California:

- Sierra Nevada mixed conifer stands: Maintain stand-level species and structural diversity over time. This should include streamside management zones where they contribute to stand level diversity.
- California Coastal Prairies and Montane Meadows: Ensure botanical and wildlife surveys occur prior to harvest. Protect meadows from harvest equipment. Encourage the restoration of natural fire regimes, prevention of conifer invasion of grasslands, and restoration of historic meadows and grasslands through the removal of trees.

Klamath-Siskiyou:

- Mixed conifers stands: Maintain stand-level species and structural diversity over time.

Southern Appalachians:

- Aquatic habitats: Implement BMPs, including those for proper road construction and maintenance, and BMPs for forested wetlands.

QUESTION FOR CONSULTATION: There is some stakeholder concern over the insufficiency of current BMPs in Alabama to protect aquatic habitats. Should we require measures beyond BMP compliance for aquatic habitats in Alabama? If so, should we require compliance with water quality standards similar to the Control Measures for anadromous salmonids, or should we have specific buffer requirements?

- Glades: Take into consideration the biodiversity values of glades when designing forwarding operations and landings.

- Montane longleaf pine: Maintain native longleaf pine per "Native longleaf pine savanna" Priority Forest Type.

Florida Panhandle:

- Longleaf pine habitats: Maintain native longleaf pine per "Native longleaf pine savanna" Priority Forest Type.
- Apalachicola Bay / river system: Implement BMPs, including those for proper road construction and maintenance, and BMPs for forested wetlands.
- Steephead ravines along Apalachicola river system: Harvest occurs in a manner that minimizes soil disturbance within steephead ravines.

Central Florida:

- Pine Flatwoods: Consider biodiversity values of xeric uplands when designating landings and forwarding areas.

Cape Fear Arch:

- Pocosins / Carolina bays: Harvest occurs in a manner that maintains native plant diversity associated with Carolina bays & pocosins.

Ouachita River Valley:

- Aquatic habitats: Implement Best Management Practices (BMPs), including voluntary BMPs.

Central Appalachians:

- Karst Habitats: Implement Best Management Practices (BMPs), including voluntary BMPs.

9.3 HCV 2. Large Landscape-level forests, Intact Forest Landscapes (IFL)

The Organization determines whether harvest is taking place in IFL on federal lands that are part of the Supply Area. Where harvest in IFL is occurring, the Organization avoids that material.

9.4 HCV 3. Roadless areas

No material is sourced from known roadless areas on federal lands, defined as Inventoried Roadless Areas and Wilderness Study Areas.

9.5 HCV 3: Priority Forest Types

Procurement policies are designed and implemented to maintain to the key habitat features of Priority Forest Types.

Forest type specific Control Measures are as follows:

Appalachian

- Mesophytic cove sites: Stands having mixed-mesophytic characteristics (as defined by Lucy Braun) are harvested in a way that maintains natural stand diversity and structure consistent with this habitat type, including some retention of late-successional elements.
- Native Spruce-Fir Forests: Spruce-Fir Forests (*Picea rubens* and *Abies fraseri*) are harvested in a way that results in regeneration of this forest type, and maintains the natural stand diversity and structure consistent with this habitat type

Northeast

- Riverbank areas of the St. John's River: Riverbank areas of the St. John's River in Maine are harvested in a way that maintains natural stand diversity and structure consistent with this habitat type.

Southeast & Mississippi Alluvial Valley

- Late successional bottomland hardwoods: Late successional bottomland hardwoods (> 80 yrs) are harvested in a way that maintains the quality and quantity of this forest type, including the natural stand diversity and structure consistent with this forest type, across the landscape. Where stands greater than 80 years old are clearcut or otherwise harvested in a manner that reduces the quality and quantity of this forest type, it is shown that a commensurate quantity and quality of bottomland hardwoods are being recruited in the > 80 year age class. Hydrology consistent with this forest type is maintained.

NOTE "Late successional" in this instance refers to bottomland hardwoods that are *at least* 80 years old *and* have the complex structural characteristics and species composition associated with late successional stands.

- Native longleaf pine savanna: The structural characteristics and species composition (i.e. longleaf pine) of native longleaf pine savannas, including retention of native groundcover, are maintained across the landscape. Where longleaf pine is harvested in a manner that reduces the quality and quantity of this forest type, it is shown that a commensurate quantity and quality of longleaf pine savanna is being recruited elsewhere.

NOTE "Native" in this instance refers to longleaf pine that occurs on a site historically maintained in longleaf pine. Where longleaf pine restoration has occurred on a site not historically maintained in longleaf pine this Control Measure (and associated *specified risk)* does not apply, although longleaf restoration can be used to satisfy the "maintained across the landscape" clause.

QUESTION FOR CONSULTATION: The Control Measures for both Longleaf Pine Savanna and Late Successional Bottomland Hardwoods require that they are "maintained across the landscape." What is a reasonable burden of proof to expect CHs to show that where these forest types are harvested there is a commensurate recruitment elsewhere?

9.6 HCV 3. Primary Forest and Old Growth

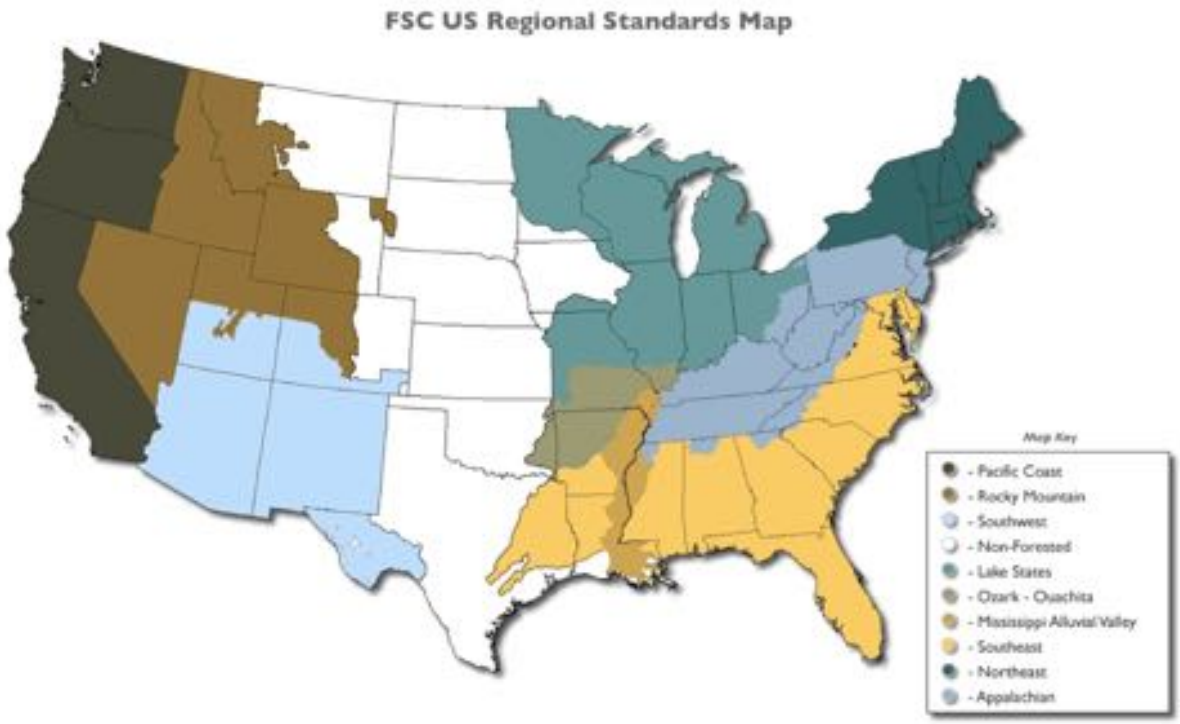
The Organization shall determine whether harvest of Primary Forest that has historically been maintained in a forest condition is taking place on public lands in the supply area, or on public and private lands when sourcing redwood. Where such harvest is occurring, the Organization avoids that material. This includes primary Old Growth (Type 1).

The Organization shall likewise determine if harvest within non-primary Old Growth (Type 2) stands is taking place within the supply area on public lands in the Rocky Mountain and Pacific Coast regions. If harvest within Type 2 Old Growth is taking place, procurement policies are designed and implemented to minimize negative impact to the Old Growth characteristics, including maintenance of structural and functional habitat characteristic of old growth, and retention of the oldest trees.

NOTE For the sake of the Controlled Wood National Risk Assessment, "Old Growth" refers to late-successional stands that fit the FM definition of Old Growth, *and that are pre-colonial in nature*. That is, they were already present and mature at the time of European colonization. Please see the definition of Old Growth and Primary Forest in the Glossary (Section 7 or Part 1 of this document).

QUESTION FOR CONSULTATION: Should Old Growth and primary forest Control Measures on private lands in the redwood region apply to all forest products, or redwood wood specifically?

Annex A: FSC-US Regions



Annex B: Report Associated with the TNC HCV assessment for the Controlled Wood NRA

Mapping High Conservation Value Forests in the United States

Methodology and Data Sources
By The Nature Conservancy for the Forest Stewardship Council

Joe Fargione, North America Region Science Director
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Executive Summary

To support FSC certification of forest products in the United States, we produced a map covering the contiguous 48 United States of forested areas likely to contain High Conservation Values (HCVs), and that were not permanently protected from forest management activities that could diminish those values. This study is intended to better understand risk associated with forest management activities to primarily forest-based values. Therefore, we identified high conservation areas across the landscape and then applied filters to identify unprotected forest areas. Non-forested areas and protected areas are unlikely to be logged or would only be logged in a manner that does not jeopardize their conservation values. Based on the FSC Controlled Wood HCV definitions, we obtained datasets to map 1) rare, threatened, and endangered species; 2) large landscape-level forests; 3) roadless areas. This study did not include HCVs associated with other ecosystem services or social and cultural values (HCVs 4-6). Specifically, we selected the Critical Biodiversity Areas based on rarity-weighted biodiversity hot spots as defined in Precious Heritage: The Status of Biodiversity in the United States (Chaplin et al. 2000). We identified intact forest landscapes based on Potapov et al (2008). Finally, we used national roadless area data compiled by federal agencies to identify roadless areas. In total, these datasets provide the foundation for a national-scale map and desktop analysis of high conservation forests, to be refined pending additional stakeholder input. Our report also includes an appendix that discusses additional datasets that were considered but not included in this analysis. The data layers included in our analysis can be viewed at a web map constructed for this purpose: http://foreststewardshipcouncil.s3-website-us-west-1.amazonaws.com/

Introduction

To support FSC-US certification of forest products, a map covering the contiguous 48 United States that identifies areas likely to be high conservation value forest is desired. Criteria defining high conservation value forests have been developed by FSC-US. The challenge is to map these criteria based on existing data. Although not developed for the purposes of defining HCV forests, existing datasets can be used to identify places that are likely to be HCV forests. Because all large-scale maps are imperfect and may suffer from misclassification errors, these datasets should be considered to define areas as being at low likelihood or high likelihood of being HCV forests. This is a very important concept. The results of this risk assessment at the very detailed level are not definitive for HCV forest, but they are functional at recognizing *likelihood* of HCV existence. This risk-based approach is intended for use in the FSC Controlled Wood system. It does not apply to FSC Forest Management (FM) certification, where specific HCVs are inventoried.

Conversely, low risk forests would not require such additional evaluation. We note that areas that are protected from commercial logging or are non-forested are, by definition, at low risk of unsustainable forest management and can be excluded from further consideration for HCV status.

The FSC Controlled Wood National Risk Assessment Framework (FSC-PRO-60-002a) defines six HCV categories, which are:

HCV 1: Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.

HCV 2: Landscape-level ecosystems and mosaics. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.

HCV 3: Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.

HCV 4: Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.

HCV 5: Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (e.g., for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples.

HCV 6: Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or indigenous peoples, identified through engagement with these local communities or indigenous peoples.

Scope

We obtained datasets that can identify forests within the following three classes of high conservation value forest:

- HCV 1 (rare, threatened, endangered species)
- HCV 2 (large landscape level forests)
- HCV 3 (old growth, roadless, primary forests)

Due to lack of appropriate data, this study does not address HCV 4, HCV 5 or HCV 6.

Data layers identification and selection

We used the following two-step approach to identify HCV forests in the lower 48.

Step 1. All areas that are non-forested OR protected were defined as 'low risk'.

a. Non-forested areas were determined by the GAP landcover data (http://gapanalysis.usgs.gov/gaplandcover/). We selected this dataset because "The

GAP national land cover data, based on the NatureServe Ecological Systems Classification, are the foundation of the most detailed, consistent map of vegetative associations ever available for the United States." We extracted the forested landcover classes (level 3 classes 4001 to 4613) to define the forested layer; areas not defined as forested were considered non-forested.

b. Protected areas were determined by the US Geological Survey's US-Protected Areas Database (http://gapanalysis.usgs.gov/padus/), including protected areas with GAP Status of 1 or 2. (http://www.gap.uidaho.edu/padus/gap_iucn.html)

Since different public lands have different levels of management goals and restrictions, it is important to consider the level of protection that applies to any given parcel of land. For this analysis, we use a definition of protected lands that includes only lands assigned a GAP Status of 1 or 2 (GAP Status is the convention used to determine the level of conservation protection in the United States). Only GAP Status 1 and 2 meet the qualification as a protected area as defined by the International Union for the Conservation of Nature. Public lands classified as GAP Status 3 are not assumed to be at low risk to conservation values because they are not managed primarily for conservation purposes and may allow extractive uses that threaten some conservation values.

It's important to recognize that GAP status is defined by political designation of an area and not the active management of that area. For example a state-owned forest area may be classified as GAP status 3 due to its land classification even if it is not engaged in commercial extraction. This does not imply that the area, upon further investigation particular to that area cannot be considered to be low risk for threat to HCVs.

GAP Status Definitions (http://www.gap.uidaho.edu/padus/gap_iucn.html):

GAP Status 1: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, intensity, and legacy) are allowed to proceed without interference or are mimicked through management.

GAP Status 2: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive uses or management practices that degrade the quality of existing natural communities, including suppression of natural disturbance.

GAP Status 3: Area having permanent protection from conversion of natural land cover for the majority of area. Subject to extractive uses of either broad, low-intensity type (eg. Logging) or localized intense type (eg. Mining). Confers protection to federally listed endangered and threatened species throughout the area.

Step 2. Use data layers specified in the FSC open standards Appendix F: High Conservation Value Forests to identify forested, unprotected lands that contain one of the following High Conservation Values:

- HCV 1 (rare, threatened, endangered species):

- Hot spots of rarity and richness (Chapin et al. 2000). This analysis identifies Critical Biodiversity Areas using a rarity-weighted richness index. The index sums up the number of federally listed threatened and endangered species that occurs in a given location. The analysis considers 2,758 species of all taxa (including plants, mollusks, arthropods, fish, reptiles, amphibians, birds, mammals). The spatial unit of analysis was a grid of hexagons, each about 160,000 acres in size. Considering the 50 United States, 15,413 hexagons cover the land area. Rarer species were given more weight, based on the number of hexagons in which a species occurs. Specifically, if a species occurs only in one hexagon then it gets full weight, if it occurs in two hexagons it counts as half, if it occurs in three hexagons it counts as 1/3, etc. These weights are summed to get the rarity-weighted richness index for each hexagon. Isoclines were drawn to surround biodiversity 'hot spots' with high rarity-weighted richness. For the purposes of this analysis, areas that had an index of 10×10^{-3} species per km^2 or greater were considered Critical Biodiversity Areas. This threshold was selected to capture known areas of high biodiversity.

- HCV 2 (large landscape level forests):
  - Greenpeace Intact Forest Landscapes. http://www.intactforests.org/data.ifl.html. These intact forest landscapes are identified using satellite data and are defined as an "unbroken expanse of natural ecosystems within areas of current forest extent, without signs of significant human activity, and having an area of at least 500 km^2" (Potapov et al. 2008). The methods for this dataset have been peer reviewed, lending confidence to their approach, although it may underestimate the presence of intact landscapes in areas that experience natural fire but are adjacent to human settlements or infrastructure (Lee 2009). High-resolution (30 meter) remote sensing data were used for land cover classification. In areas of current forest extent, all areas influenced by humans were removed: residential areas, roads, railroads, transmission lines, and anthropogenic fires. Linear infrastructure was buffered by 1 km. Fires were assumed to be anthropogenic if they were "in the vicinity of infrastructure or developed areas." Remaining forested areas had to be at least 500 km^2 and at least 10 km wide at their widest. Corridors narrower than 2 km^2 (and the areas they connected to, unless they independently met the above criteria) were excluded.
- HCV 3 (old growth, roadless, primary forests):

We included two datasets on roadless areas, one from BLM and one from the U.S. Forest Service.

  - Identification of BLM wilderness study areas was mandated in the Federal Land Policy and Management Act of 1976, which directed the Bureau to inventory and study its roadless areas for wilderness characteristics [http://databasin.org/datasets/eea0e495148b446594356982001c458c]. To be designated as a Wilderness Study Area, an area had to have the following characteristics: 1) roadless areas of at least 5,000 acres of public lands or of a manageable size; 2) generally appears to have been affected primarily by the forces of nature; 3) provides outstanding opportunities for solitude or primitive and unconfined types of recreation. In addition, Wilderness Study Areas often

have special qualities such as ecological, geological, educational, historical, scientific and scenic values.

- We used the USFS dataset on inventoried roadless areas for the contiguous US, as provided by the USDA Forest Service - Geospatial Service and Technology Center [http://databasin.org/datasets/79e0f98053b644ec8b7c89fc597b2d59]. They describe the data as follows: "This dataset contains all National Forest Inventoried Roadless Areas (IRAs) for the lower 48 states, including Puerto Rico. Alaska is maintained separately. The IRA data was originally submitted to GSTC by all national forests through their Regional Offices for the Forest Service's Roadless Area Conservation Initiative. The data was consolidated at the GSTC and used in the Draft Environment Impact Statement. Between the draft and final stages of the Environmental Impact Statement, the data was updated by the forests to reflect any corrections to Inventoried Roadless Areas that were based on existing forest plans and administrative record. The data was also supplemented to include Special Designated Area information and to include Inventoried Roadless Areas within Special Designated Areas. The data was resubmitted to the GSTC on July 21, 2000 for consolidation and the completed coverage was used in the Roadless Area Conservation Final Environmental Impact Statement. On October 15, 2002, the Gallatin National Forest submitted a technical correction to the Inventoried Roadless Area GIS database. A portion of the original GIS data was corrected to match the 1999 IRA maps that are part of the forest administrative record. IRAs are based on completed forest plans, forest plans in revision where the agency has established an inventory (this information should be available in Appendix C of most forest plans), or other assessments that are completed and adopted by the agency. RARE II information was used in cases where a forest does not have a more current roadless inventory, which was established using RARE II information."

Discussion

Any analysis conducted at the national scale is limited by data quality and resolution. Land management decisions ultimately require on-the-ground assessment and evaluation to ensure accurate information. The data presented here are the best available and can inform broad scale decision-making. Different data layers contained here have different levels of accuracy, precision, and resolution. The data layers that identify non-forested and protected areas are relatively accurate for the purposes of identifying low-risk areas.

The Critical Biodiversity Areas analysis is based on field data collected by state Natural Heritage programs, which provides a robust basis to analyze areas that contain the most rare species. For several reasons, we consider this to be a conservative analysis of areas important for biodiversity. First, it only considers species that are federally listed as threatened or endangered, which omits many species of conservation concern. Second, the approach heavily discounts species that do not have very narrow ranges. One third of endangered species occurred in only one hexagon. The other species occurred, on average, in 6.25 hexagons and carry 16% of the weight of a rare species in each hexagon. Giving more weight to these more widely distributed species would broaden the areas identified as biodiversity hot spots. Conversely, the analysis may be too liberal because of the relatively coarse resolution of spatial analysis. Each hexagon is

160,000 acres, such that some areas within the hexagon most likely do not serve as habitat for endangered species, but this analysis does not attempt to identify those areas.

We believe that the intact forest landscapes are a conservative estimate of large landscape-level forests. The high-resolution remote sensing data accurately identifies forests and human infrastructure. The approach of removing burned forests in areas "in the vicinity of infrastructure or developed areas" likely omits some forests that actually burned by natural causes even though they are in the vicinity of infrastructure or development.

We used official federal datasets about inventoried roadless areas on Forest Service and BLM lands. This is a conservative estimate of roadless areas in the United States because it only considers lands managed by these agencies. However, this is the best available approach because these data are vetted and confidently represent roadless areas. Novel analyses based on existing road datasets would identify too many areas as roadless, because the road datasets are incomplete, especially for forest roads. The best available road data is the U.S. Census Bureau's TIGER road dataset. A new version of this dataset, reflecting roads present in 2010, was released in August 2012. This dataset is based on digitizing USGS topographical maps based on old field surveys updated with remote sensing. However, this dataset is not suitable for identifying roadless areas nationally because it does not comprehensively include forest roads, many of which are hard to detect with remote sensing because they are covered by the forest canopy. Although some national forests may maintain a dataset of the roads in their forest, there is no nationally compiled dataset of these forest roads, and datasets that may exist for individual forests are not generally publically accessible.

Conclusions

The three datasets collected here provide national coverage using a combination of high-resolution remotely sensed data and field surveys and directly address the criteria for defining HCV forests. They provide a sound basis for identifying areas that qualify as high conservation value forests based on the criteria of being a hot-spot for rare and endangered species, roadless, or large landscape-scale forests. However, several other factors that could cause forests to have high conservation values are not captured by these analyses due to a lack of available datasets. In particular, we do not have datasets that allow us to confidently identify old-growth areas, cultural values, or critical ecosystem services. It would require massive field survey efforts to identify old growth or cultural values nationally, using consistent methods. In contrast, several modeling approaches are possible to quantify ecosystem services. However, further work would need to be conducted to determine if and how a critical ecosystem service analysis applies in the United States. The critical ecosystem service criterion may primarily apply in developing countries or with indigenous peoples where subsistence depends on hunting wild game in forests, shifting cultivation of forests, or other forest products.

Appendix 1: Data layers considered but not included

There are several data layers that were considered by not included. We list each below, with a rationale for why it was not included. In general, these layers did not provide national coverage, were redundant with other layers that were included, use datasets that are now outdated, were analyzed at too coarse a resolution, or identified areas that were not suitable proxies for the FSC's HCV criteria.

HCV 1 (rare, threatened, endangered species)

- Designated critical habitat as defined by the United States Fish and Wildlife Service (USFWS). This single-species approach does not capture areas critical for biodiversity more generally. Further, these designations are only available for a small number of species of concern. Designated Critical Habitat is defined for areas identified by the USFWS for species listed as endangered under the U.S. Endangered Species Act. Critical habitat is an official designation, defined in the Endangered Species Act. USFWS described critical habitat as "a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection." Due to limited staff and funding, critical habitat has been designated for only a minority of all listed species. Up-to-date critical habitat data can be accessed directly from the USFWS here: http://criticalhabitat.fws.gov/crithab/. The federally designated critical habitat is the product of a political process and is not purely a biological determination.
- Aquatic Biodiversity Hot Spots as defined in the Rivers of Life report (http://www.natureserve.org/publications/riversOflife.jsp). Aquatic biodiversity hot spots are areas known to contain many at-risk fish and mussel species. However, the watershed resolution is relatively large and so likely includes some areas for which logging would not pose a risk for the at-risk aquatic biodiversity. Forests in the riparian zones in these watersheds, however, are particularly valuable from a conservation standpoint. This identifies watersheds that contain different numbers of at-risk fish and mussel species. At-risk species are those defined as globally Critically Imperiled, Imperiled, or Vulnerable, based on consideration of rarity, threats, and population trends (i.e., with a G-rank of 1-3; http://www.natureserve.org/explorer/ranking.htm). The analysis was conducted for sub-basin watersheds that are on average 700 square miles large (i.e. an 8-digit HUC) http://en.wikipedia.org/wiki/Hydrological_code. This is the finest resolution at which these data are available.
- State Wildlife Action Plans: maps of High Priority Habitats. Not a viable option- many states do not actually have these mapped, just verbal descriptions. Some may have pdfs, but GIS data are not available. Quality is also highly variable.

HCV 2 (large landscape level forests)

- World Resources Institute: Low access forests and their level of protection in North America (2002). This dataset is based on older road and land cover data than the large landscape forests dataset that we used. Also, the analysis uses coarse scale road data that does not include "small roads" or "logging roads". They note that a finer-scale analysis in New England identified 40% more roads than were included in their analysis.
- The Wilderness Society: Relative Wildness in the United States. Wildness is measured using an index calculated at a 1 square km resolution based on data available in 2000. The index is based on population density, distance from roads, dams, land cover, lights at night, and EPA pollution point sources. This dataset is relatively dated, too coarse, and combines information that is not necessarily relevant to FSC's definition of HCV forests (e.g. dams) with other information that is redundant with our roadless analysis

The following five regional analyses were considered. The national large forest landscapes data allows a national perspective on large intact forest landscapes. We elected not to introduce

regional datasets that used diverse methods that would have introduced inconsistency across regions.

- TNC matrix forest blocks http://www.2c1forest.org/atlas/metadata/matrix_metadata.htm. Matrix sites are large contiguous areas whose size and natural condition allow for the maintenance of ecological processes, viable occurrences of matrix forest communities and embedded rare species and communities. The goal of the matrix forest selection was to identify viable examples of the dominant forest types that, if protected, would serve as critical source areas for all species requiring interior forest conditions or associated with the dominant forest types. Matrix occurrences are bounded by fragmenting features such as roads, railroads, major utility lines, and major shorelines. The bounding block feature types were chosen due to their ecological impact on biodiversity in terms of fragmentation, dispersion, edge-effects, and invasion of alien species. This analysis covers New England and the Central Appalachians. The original analysis identified Tier 1 and Tier 2 matrix forest blocks. For the purposes of identifying high-risk HCV areas, we only include the Tier 1 matrix forest blocks, which represents matrix forests from different elevations, bedrock geologies and land forms (e.g. valleys, cliffs, etc.).
- Possible Old Growth on National Forest Land in the Southern Appalachians (Southern Appalachians Assessment: Terrestrial Resources Technical Report. 1996; http://www.samab.org/site/publications/). The inventory included stands over 100 years old and designated wilderness areas.
- Late seral forest on private lands for the Klamath-Siskiyou ecoregion (Conservation Biology Institute, 2002; http://databasin.org/datasets/806a5cf3afc04778a6aa34725a757857). Data are from 1999 and 2000 Landsat imagery, used to identify conifer forests, more than 200 years old. The full report is available here http://databasin.org/galleries/dfd8fd17f9b34774a5d6a671e2901b14. No information on training datasets or accuracy were included in the report.
- Coastal Temperate Rainforest - Remaining Late Seral Forest Fragments in Northwest North America (Ecotrust, Pacific GIS, & Conservation International, 1995; http://databasin.org/datasets/7f72a68ac6c343bda3ffff4bef3926de). The full report is available here www.ecotrust.org/publications/**Rainforests_of_Home**.pdf. "Analysts determined the extent of the remaining undeveloped forest by subtracting a GIS layer representing areas primarily affected by human activity from the layer of original forest distribution. The "human development" layer was assembled from sources giving some indication of areas primarily affected by farming, logging, or urban development. These sources included forest and vegetation classification data sets as well as more general land use and land cover data sets. Similarly, contiguous areas of remaining mature forest were compiled in the GIS from a number of forest classification data sets for specific areas within the region, mainly at the state or provincial level. Analysts selected the data sets that offered the widest coverage for each given area, and those that best distinguished managed from unmanaged forest. Where necessary, auxiliary data sets were added to complete the geographic coverage. Again, analysts extracted from each data set just those areas indicating mature or old-growth forest (or some surrogate measure on this condition), on the assumption that these areas best represented undeveloped forests. Analysts recognized that some very old second growth might be included and areas of undeveloped forest may have been omitted. In Alaska, the non-forest undeveloped areas

were taken from satellite imagery and GIS databases that distinguish forest from non-forest types. Remaining mature forest areas included those classified as forests but not shown in databases of harvested areas."

- Northern California (USA) U.S. Forest Service Late-Successional Reserves (USFS 2003, http://databasin.org/datasets/e12f559cda4743b1b76cc8715bcd677a). "This coverage contains polygon features representing Late-Successional Reserves (LSR) and Managed Late Successional Areas (MLSA) of each of the Region 5 northwest forests (Klamath, Six Rivers, Shasta-Trinity, Mendocino, Lassen) within the Northwest Forest Plan (NWFP). The objective of LSRs is to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. MLSAs are similar to LSRs but are identified for certain owl activity centers where regular and frequent fire is a natural part of the ecosystem and limited timber management practices are permitted. These LSRs and MLRAs include only the first two elements of the NWFP LSR system: (1) areas mapped as part of an interacting reserve system; and (2) LS/OG 1 and 2 areas within Marbled Murrelet Zone 1, and certain owl additions mapped by the Scientific Panel on Late-Successional Forest Ecosystems (1991). They do not include Element 3, occupied marbled murrelet sites or Element 4, known spotted owl activity centers."

HCV 3 (old growth, roadless, primary forests)

- There is no national dataset of old growth or primary forests. We attempted to use the LANDFIRE dataset to identify areas of late succession forest in habitat types where late succession forest is rarer than it was historically. However, this approach is based on remote sensing of forest structure rather than field surveys and consequently identified many places as old-growth that are in fact likely to be second growth. Under-represented late successional forest derived from LANDFIRE data http://www.landfire.gov/. LANDFIRE classifies current landcover based on its successional state. Of course, successional trajectories vary from place to place. So LANDFIRE defined unique successional trajectories for each 'biophysical setting'. In the United States, 544 biophysical settings were defined such that biophysical factors and therefore successional trajectories are relatively homogeneous within a given biophysical setting. For each biophysical setting, up to five successional states were defined, allowing the identification of a late successional stage for each biophysical setting. We used this information to identify all current vegetation that is in a late succession stage. However, not all late successional forests should be considered old growth. In fire-dependent forests, late successional forests can be the result of fire suppression that has altered natural disturbance regimes. In such places, such as the Ozark Mountains, the highest conservation value forests are mid-successional open-canopy savannas where natural fire regimes have been maintained or restored. Closed-canopy, late successional forests tend to lack the high conservation value fire-dependent plant and animal communities that occur in open-canopy savannas. Therefore we only included forests in biophysical

settings where the prevalence of late succession forests was reduced from historic levels (e.g. through land clearing and logging). In contrast, we did not include forests in biophysical settings where the prevalence of late succession forests had increased (e.g. through fire suppression). To accomplish this, we made use of LANDFIRE's historical vegetation models, which estimate the proportion of historic vegetation in each successional class for each biophysical setting. This allowed us to identify under-represented late successional forests, i.e. those late successional forests that occurred in a biophysical setting where late successional forests have declined from historical levels. LANDFIRE classifies each 90x90 meter pixel into a single successional class, independently of how its neighbors are classified. Thus even a very small patch of forest, if it is dense and tall enough, could be classified as late-successional. This resulted in the identification of some pixels that clearly would not qualify as old-growth, such as small forest patches in urban or suburban areas. To eliminate these areas embedded within settled landscapes, we used a land cover classification scheme to select just wild and remote areas, excluding settlements and residential and inhabited woodlands (Ellis et al. 2010); http://ecotope.org/anthromes/v2/data/.

- We considered conducting an independent roadless areas analysis. The best available road data is the U.S. Census Bureau's TIGER road dataset. A new version of this dataset, reflecting roads present in 2010, was released in August 2012. This dataset is based on digitizing USGS topo maps based on old field surveys updated with remote sensing. However, this dataset is not suitable for identifying roadless areas nationally because it does not comprehensively include forest roads, many of which are hard to detect with remote sensing because they are covered by the forest canopy. Although some national forests may maintain a dataset of the roads in their forest, there is no nationally compiled dataset of these forest roads, and datasets that may exist for individual forests are not publically accessible. Thus, it is not possible to definitively identify roadless areas using a national GIS exercise.

HCV 4 critical ecosystem services:

- Important areas for surface drinking water, USFS Forests to Faucets report http://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml. In this index, 'importance' is a measure of the number of people who are provided drinking water from a sub-watershed weighted by the distance upstream from the water supply intake. It is likely to give an accurate indication of the location of sub-watersheds that are important for drinking water provision. However, each sub-watershed is about 40 square miles lage on average (i.e. a 12 digit HUC; about 40 square miles large on average), this dataset does not provide any indication of which areas within those watersheds are more sensitive for drinking water provision than others. This weighting is designed to capture the larger influence that areas adjacent to the water intake are likely to have on water quality compared to areas farther upstream. Specifically, the farther removed from an intake, the less influence a sub-watershed is likely to have. Therefore, the index includes a weighting function, such that the index equals the number of people served by intakes in that sub-watershed plus a fraction of the population served by downstream intakes.

This analysis makes use of data on location of surface drinking water intakes and number of people served by each intake from the US EPA Safe Drinking Water Information System (http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/index.cfm).

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Part III: Conversion Risk Assessment and Due Diligence System requirements

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I. Introduction and Summary

1.1 Definition of Conversion

Conversion of forests is addressed as Risk Category 4 of the National Risk Assessment, which encompasses conversion of natural and semi-natural forest to both non-forest conditions and *plantations*.

Non-forest conditions include agriculture, development, and other infrastructure. Conversion to non-forest conditions does not include timber harvests where the land is maintained in a way that will result in the regeneration of the stand.

Plantations as defined in the FSC system are planted stands that lack the *principal characteristics and key elements* of natural forest systems. It is important to note that FSC does not consider all planted stands as *plantations.* Examples of *plantations* per the FSC definition include, but are not limited to, planted stands of exotic tree species and forest stands dependent on extensive hydrologic modification. The Plantation Classification Guidance from the US Forest Management Standard is included here as Annex B.

1.2 Summary of Risk Assessment

Two separate datasets were used to assess conversion in analyses conducted by both the National Council for Air and Stream Improvement (NCASI) and FSC-US staff. The datasets used are the US Forest Inventory and Analysis (FIA) and National Land Cover Database (NLCD). FIA is based on a series of plots across the US that are remeasured roughly every six years. NLCD is a remote-sensing based dataset that classifies land use into one of sixteen categories that are remeasured every five to ten years. FIA was determined to be a more appropriate dataset, but remeasurement data was only available for the eastern US. For the purposes of the National Risk Assessment, FIA was used in the eastern US, and NLCD was used in the western US.

Results of these analyses are shown in Annex A. Both datasets demonstrate relatively stable forest cover, measured at the ecoregional level, across the US. Where there was net forest loss, it was minimal and could not be considered statistically distinguishable from zero. Based on these data, the US Controlled Wood Working Group reccomended a *low risk* designation for forestland conversion in the US.

1.3 Summary of Due Diligence System for Conversion

Although the extent of forestland cover is relatively stable in the US, it is recognized that there are localized instances of conversion. Additional due diligence measures have therefore been implemented as part of the Due Diligence System covered in Part 1 of this document.

The Due Diligence System is designed to avoid material from known instances of forest conversion. This due diligence applies across the supply area with the following exemptions:

- *De Minimus* Exemption: Conversions of forestland to non-forest under 40 acres in size are exempted in recognition of the difficulty of tracking small conversions, the small amount of material they account for in the supply chain, and the fact that they are likely to occur regardless of forestry decisions. For conversion to Plantations, areas under 20 acres are exempted. This stricter threshold recognizes that conversion to Plantation is a forestry-driven decision.
- Urban Infill Exemption: It is recognized that urban infill is likely to occur regardless of forestry decisions, and therefore areas within the municipal boundaries of incorporated towns are exempted from the due diligence system.
- Public Benefit Exemption: Conversion of forest to non-forest that result from a public benefit project or as part of a community development plan based on public participation are exempted in recognition of the public benefits of these projects. This exemption does not apply to conversions from natural or semi-natural forest cover to Plantations.
- Mill Expansion Exemption: Where it is necessary for a FSC Chain of Custody certified mill to expand their operations, material is exempted that results from the expansion of that mill. This exception recognizes the benefits of increased markets for FSC certified material and Controlled Wood that results from increased mill capacity. This exemption does not apply to conversions from natural or semi-natural forest cover to *plantations*.

II. Conversion Risk Assessment Framework

Guidance	Threshold	Sources of Information	Risk Justification	Functional Scale	Control Measures
4.1 Conversion of natural forests to plantations or non-forest use in the area under assessment is less than 0.02% or 5000 hectares average net annual loss for past 5 years (whichever is less), OR Conversion is illegal at national or regional level on public and private land Note: The following changes are not considered applicable conversion according to the indicator: (legal) road construction, logging landings and infrastructure development to support forestry operations.	Is conversion as defined by the indicator occurring within the area under assessment? Is land use change for natural or semi natural vegetation effectively prevented by legislation or is there a binding public policy on public and private land? Are there any significant economic drivers for conversion of forest and other wooden ecosystems to plantation or non-forest use, including: a) Is the economic environment favorable to conversion? b) Are there direct or indirect incentives for conversion?25 NOTE: Land use change data can be used to determine the scale and intensity of conversion. Clear cuts occurring as a legally accepted forest management practice followed by regeneration of forest coverage are considered as acceptable conversion. Spatial data may be used for conversion assessment when evaluated as sufficient for use in risk assessment. In the case of conducting spatial analysis for assessing the risk, only objects equal or larger than 1 ha need to be considered.	**National Land Cover Dataset (NLCD)** **USFS Forest Inventory and Analysis (FIA)**	*Low risk* Based on results from ecoregional assessments using both FIA and NLCD data that are not significantly different from zero net forest cover change in all ecoregions.	National	N/A

III. Explanatory Materials for the Framework – Conversion

3.1 Conversion in the Context of Controlled Wood

3.1.1 Defining conversion

This analysis does not consider *conversion* that occurs in Alaska or Hawaii. The term "United States" in this document refers to the conterminous 48 states.

Forest conversion is defined as land that moves from natural or semi-natural forest cover to *plantation* or a non-forest use. "Plantation" in this context is consistent with the definition of Plantation in the FSC system, where the Plantation lacks most of the characteristics of a natural forest. *Plantations* are specifically defined in Appendix G of the FSC-US Forest Management Standard (v1.0), which is included here as Annex B.

Timber harvest and natural disturbances are not considered conversion as long as the site is regenerated, and is maintained in natural or semi-natural forestland (i.e. not non-forest or Plantation) in the long term. Sites that do not have tree cover due to recent harvest or disturbance are still considered forestland as long as they are managed in a way that will regenerate the stand in a manner consistent with natural or semi-natural forests, including tree planting.

3.1.2 Conversion of natural and semi-natural forest to plantations

Natural or semi-natural forests that are changed to *plantations* per the FSC definition are considered conversion. There is no practical way to distinguish FSC-Plantations from natural or semi-natural forests using readily available datasets, however. These is some information regarding planted stands in the Southern Forest Resource Assessment (SFRA), but planting alone does not distinguish Plantations as defined in the FSC system.

3.1.3 Drivers of conversion

Forests have been converted to a variety of non-forest land uses, but the largest historic losses in the US are due to urban and agricultural expansion. From 1907 to 1997 the average annual forest loss across the US was 800,000 hectares a year, or 0.3% of the total forest cover. In the 1990s this rate of conversion was reduced slightly to 600,000 ha a year. Roughly half of these losses occurred in the southeast and south central US[1].

In the latter half of the 20th century, there was also a large increase in southern planted-pine, from 1.8 million acres in 1952 to 32 million acres in 2000. These planted pine stands occurred both on sites that were previously harvested natural stands and abandoned agricultural land. The advent of intensive mechanical site prep and hydrologic modification, grew rapidly in the 1960s and 1970s[1].

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[1] Fox, T. R., Jokela, E. J., & Allen, H. L. (2007). The development of pine plantation silviculture in the southern United States. *Journal of Forestry*, *105*(7), 337–347.

Currently the strongest pressure to convert forests appears to come from expanding urbanization. The U.S. Department of Agriculture has conducted a Natural Resources Inventory since 1982 that shows trends in land use on a state-by-state basis. Forestland cover changes depend on the state, and generally track other forestland change estimates. In every state agricultural land diminished in that time frame, from a national total of 420 million acres in 1982 to 357 million acres by 2007. Concurrently, developed (urban) land increased by 40 million acres to 111 million acres[2].

3.2 Conversion Datasets

The FSC US Controlled Wood Working Group (CWWG) agreed to use of the best available datasets for determining rates of conversion. The two datasets that are readily available and have sufficient sampling effort to provide rigor are The USDA Forest Inventory and Analysis (FIA) and National Land Cover Dataset (NLCD).

3.2.1 USDA Forest Inventory and Analysis (FIA)

FIA is the US Forest Service's "forest census," and consists of an annual survey of a subset of plots collected from a comprehensive grid laid over the US[3]. Each cell in the grid represents 5,930.5 acres, and a 0.17 acre sample plot has been randomly established within each cell. Forest inventory teams visit each plot every five to ten years, and a wide variety of metrics are collected. The primary metric relevant to conversion classifies the plot as either wholly or partially in either a forest or non-forest condition. Where a given plot is only partially in a forest condition, the proportion is recorded.

FIA defines forestland as: "*land that is at least 10 percent stocked with trees of any size, or that formerly had such tree cover and is not currently developed for a nonforest use. The minimum area for classification of forest land is one acre. The components that make up forest land are timberland and all noncommercial forest land*." This is an appropriate definition when considering forest conversion, since a plot is still classified as forested even when there is no overstory due to recent harvest or natural disturbance. Each plot is visited directly by trained professionals and therefore the likelihood of forestland misclassification is low.

The primary limitation of FIA data is that the sample density is low (1 plot per 6,000 acres), and that the plot design was changed substantially in the 1990s such that older data is not compatible with more recent data. Only plots in the eastern US have been re-sampled under the new system as of 2012. Additionally, a power analysis of forest conversion estimates using FIA data has shown that regions with fewer than 400 plots may not have the statistical power necessary to determine conversion rates[4]. Due to these limitations, FIA cannot currently (as of 2014) be used in the Western US, or in a few eastern

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[2] U.S. Department of Agriculture. 2009. *Summary Report: 2007 National Resources Inventory*, Natural Resources Conservation Service, Washington, DC, and Center for Survey Statistics and Methodology, Iowa State University, Ames, Iowa. 123 pages. http://www.nrcs.usda.gov/technical/NRI/2007/2007_NRI_Summary.pdf

[3] http://www.fia.fs.fed.us

[4] Van Deusen, Paul C.; Roesch, Francis A.; Wigley, T. Bently. 2013. Estimating forestland area change from inventory data. Journal of Forestry 111(2):126–131

ecoregions with small sample sizes. Where it is available, FIA provides a reasonably robust dataset for estimating rates of conversion.

3.2.2 National Land Cover Database (NLCD)

The National Land Cover Database is a remotely sensed land cover dataset produced by the Multi-Resolution Land Characteristics Consortium that is based on Landsat satellite data[5]. The dataset consists of 30m x 30m pixels classified as one of 16 land use classifications. These include three types of forest cover, wetlands, herbaceous cover, shrub / scrub, and three classifications for different intensities of development. These land cover classes are stratified such that they can also be considered as a simplified system with only eight land-use classes where the three forest and three development classes are combined into a single class each. Using this simplified (Level 1) classification improves classification accuracy.

A potential limitation of NLCD data is that it does not directly distinguish between permanent forest cover loss (conversion) and temporary loss due to harvest or disturbance. Although NLCD has been criticized as unviable for estimating *conversion* due to this limitation, there is a simple correction that minimizes the potential error sufficiently for the purpose of conversion analysis. Specifically, NLCD initially classifies a timber harvest or natural disturbance as a change from forest cover to herbaceous cover. This land cover classification evolves into shrub/scrub cover as the stand regenerates, before returning again to a forest classification once the stand has regrown sufficiently. To account for non-conversion harvest or disturbance, any pixel that changes from forest cover to herbaceous or shrub/scrub cover should therefore not be considered as converted to a non-forest use.

A given pixel should only be considered converted when forest cover changes to either a developed or agricultural use. In areas where forest cover is the natural climax cover type, any change from herbaceous or shrub/scrub classifications to developed or agricultural classification should also be considered conversion, since it is assumed that the herbaceous or shrub/scrub cover would eventually become a forest if left undeveloped. Under this same assumption, the reverse should also be considered change from non-forest to forest (reforestation), and accounted for in net loss estimates. That is, change from developed or agricultural land to herbaceous or shrub/scrub cover should be considered reforestation since that change would indicate the pre-conditions for a forest.

The assumption that herbaceous or shrub/scrub cover should be considered "pre-forest" is invalid where ecoregions are poorly defined, or when the analysis is not done on an ecoregional scale (e.g. at a state level). Where herbaceous or shrub/scrub cover is the climax community, it is not indicative of a regenerating forest. Determination of whether or not the forest as climax cover assumption is valid was made on a case-by-case basis, and areas where it fails were excised from the FSC-US staff NLCD conversion analysis.

3.2.3 Noted differences between FIA and NLCD datasets.

[5] http://www.mrlc.gov

NLCD and FIA demand different sets of assumptions with regard to forest conversion estimates. The main assumption made in FIA estimates is that the sample plot is representative of its associated 6,000 acre grid cell. The main assumption made in NLCD estimates is that herbaceous and shrub/scrub cover should be considered "pre-forest" and treated like forest cover. The validity of this argument depends heavily on the ecoregion being considered, and how well defined that ecoregion is. For ecoregions with complex forest / non-forest mosaics, there will be erroneous estimates where conversion occurs on grassland or shrubland. For both datasets it is important that these assumptions be considered on a case-by-case basis.

3.2.4 Selection of Best Available Data for the Risk Assessment

The Controlled Wood Working Group made a decision to use FIA estimates where available, and to rely upon NLCD estimates where either FIA annual inventory plots have not been remeasured or there is an insufficient number of plots to provide reliable estimates.

Where acceptable sub-regional data is available and acceptable, as determined by the CWWG, additional sub-regional estimates of conversion can be made to provide more spatially explicit assessments of specified risk.

3.3 Conversion Dataset Results

3.3.1 National Council for Air & Stream Improvement (NCASI) Analysis

NCASI produced an analysis for FSC-US of FIA data for the eastern US ecoregions, and an NLCD analysis for western US ecoregions. The results of these analyses are shown in Annex A. In the NLCD analysis of western ecoregions, 19 out of 23 ecoregions exhibited a net forest loss, and 15 out of 23 ecoregions exhibited a net loss greater than the 0.02% annual threshold. All of the eastern FIA ecoregions demonstrated net forest cover gain.

The authors of the NCASI Analysis produced for FSC-US also published a peer-reviewed article in the Journal of Forestry that provides an estimate of variance for the FIA data[4]. Their results demonstrate that the standard error associated with these FIA analyses is almost always greater than the difference between the estimates and the zero forest cover change. That is, the rates of forest cover change are so small as to be statistically insignificant.

It should be noted that in order to obtain an estimate of variance, the authors used a different methodology to estimate forest cover change in the Journal of Forestry article than they did in the analysis prepared for FSC-US. The two results are therefore not directly comparable.

3.3.2 FSC-US Analysis

FSC-US analyzed the same datasets with slightly different assumptions and methodologies. The FSC-US analysis also used the newer World Wildlife Fund (WWF) ecoregion delineations instead of Bailey's ecoregions.

In the FSC-US analysis, 10 out of 20 eastern ecoregions had a net loss of forest cover according to FIA data. Of these, 9 exceeded the 0.02% threshold. Of 13 ecoregions analyzed using NLCD data, 6 had net loss, of which only one (Puget Trough) exceeded the 0.02% threshold.

3.3.3 Discussion

Overall both datasets and separate analyses by FSC-US and NCASI demonstrate that forest cover in the United States is relatively stable. Although standard errors are not available for these analyses, Van Deusen et. al. (2013)[4] emphasize that the expected estimates of error are greater than the differences demonstrated by both FSC-US and NCASI.

No estimate of error is available for the NLCD data, but the measured rates of forest cover change are sufficiently small that it is reasonable to assume that they are also within a standard error of zero. This is further emphasized by the difference between the FSC-US and NCASI analyses that results from slightly different sets of assumptions. While these are both very robust datasets, the actual rates of change are simply too small to reliably measure their difference from zero.

3.4 Southern Forest Resources Assessment

The Southern Forest Resources Assessment (SFRA) is an analysis that is also built upon FIA data[6]. In addition to forest cover change, the assessment includes changes to planted pine stands, but does not differentiate between planted pine stands and *plantations* per FSC's definition.

The SFRA demonstrates a slight increase in natural forest cover of 0.6% across the south. The change in natural forest cover is spatially variable, however, and differs substantially between the different states. The SFRA also demonstrates a decrease of 16.5% in natural pine stands across the south between 1989-1999. About half of this is attributable to an increase in planted pine. The rest is due to natural successional processes changing the pine to oak-pine and upland hardwood stands.

IV. Due Diligence System Requirements and Justification – Conversion

4.1 Due Diligence System Requirements

The Due Diligence System requirements in regards to Controlled Wood are established in the Due Diligence System (Section 3) of Part I of this document. They are:

Category 4 – Conversion: The Organization shall implement a system designed to avoid, including through language in the Controlled Wood Policy and supplier agreements, material from land where natural forest cover is being converted to non-forest uses or plantations.

[6] http://www.srs.fs.usda.gov/sustain/report/

NOTE The risk assessment for Conversion is contained in Part 3 of this document. The Controlled Wood Working Group (CWWG) designated *low risk* for Conversion, but with the inclusion of these additional due diligence elements.

NOTE Plantations are defined by FSC to be forest areas, "that lack most of the principle characteristics and key elements of natural forests", as described in Appendix G of the FSC US FM Standard. In the Controlled Wood system, change from natural forest cover to plantation is considered forest conversion.

The following are examples of stand types that are considered plantations:

- Cultivation of exotic species or recognized exotic sub-species. Exceptions to this may include research areas where species' range limits are being explored to address global climate change.
- Block plantings of cloned trees resulting in a major reduction of within-stand genetic diversity compared to what would be found in a natural stand of the same species.
- Stands established through hydrological modification, including the installation of pattern ditching, that affects the water table and resulting stand hydrology.

Wood from known instances of conversion of natural or semi-natural forest to plantations is avoided with the following exceptions:

- Instances of conversion of natural or semi-natural forest to plantation of 20 acres or less.

Wood from known instances of conversion of natural or semi-natural forest to non-forest conditions is avoided with the following exceptions:

- Instances of conversion of natural forest to non-forest conditions of 40 acres or less, OR
- Instances of conversion resulting directly from the expansion of a FSC Chain of Custody certified mill, OR
- Instances of conversion of natural forest to non-forest conditions within the municipal boundaries of an incorporated city or town, OR
- Instances of conversion as part of a publicly participative and interactive community development plan, OR
- Instances of conversion of natural forest to non-forest conditions as part of a public benefit development such as a right-of-way, power lines, etc.

4.2 Justification for Conversion Due Diligence System

4.2.1 Risk Designation & Due Diligence

Based on the results of the NLCD and FIA conversion analyses conducted by both FSC-US staff and NCASI, the Controlled Wood Working Group determined that Conversion is best addressed through the Controlled Wood Due Diligence System (CW-DDS).

Actual forest conversion rates are sufficiently close to the threshold established Controlled Wood indicator 4.1 that ecoregions cannot be reliably designated as either *low risk* or *specified risk,* despite two robust datasets. Additionally, where conversion does occur, it is such a minor component of any given supply chain that full Control Measures associated with *specified risk* would be unwarranted. It is recognized, however, that conversion does occur in the US, and it warrants specific consideration within the CW-DDS.

The due diligence parameters established in the above section are designed to focus on instances where the negative effects of conversion are greater, and where forestry-based decisions are more likely to have an on-the-ground impact.

4.2.2 Conversion Size De Minimus

The Controlled Wood Working Group agreed that the Controlled Wood system does not have to address small conversions with limited impact that would be very hard to track in the system. The Working Group therefore established a *de minimus* acreage threshold below which due diligence need not apply. The Working Group further recognizes that the impact of the Controlled Wood Due Diligence System is greater where conversion is driven by forestry factors versus non-forestry. The *de minimus* is therefore stricter with regard to conversion of forest to Plantation than to non-forest uses.

4.2.3 Urban Infill

The Controlled Wood Working Group determined that the Controlled Wood system is unlikely to affect instances of conversion associated with the infill of urban areas. Urban infill is driven by non-forestry related factors, and often the value of forests being converted has already been marginalized. There is therefore a due diligence exemption for converted material from areas within urban boundaries (i.e. within the municipal boundaries of an incorporated city or town). Since this infill would occur regardless, it is preferable to use the material than allow it to become part of the waste stream.

4.2.4 Beneficial Community Projects

The Controlled Wood Working Group determined that conversion resulting from projects that benefit a community should be exempted from due diligence measures. Therefore exemptions were included for instances of conversion as part of a publicly participative and interactive community development plan, and instances of conversion of natural forest to non-forest conditions as part of a public benefit development (e.g. public right-of-way, power lines, etc.)

V. Annex A – Forest Cover Change Estimates

NCASI Forest Inventory and Analysis (FIA) Analysis for FSC-US

Bailey's Ecoregion	Ecoregional description	Gross Change (%)	Net Change (%)	FIA n	FIA Remper
222	Midwest Broadleaf Forest	-0.0746	0.2787	20033	5.2
M211	Adirondack - New England Mixed Forest	-0.0915	0.0173	207.1	7
234	Lower Mississippi Riverine Forest	-0.0917	0.37	2477	7.6
212	Laurentian Mixed Forest	-0.1214	0.4528	17996	5
411	Everglades	-0.13	0.9403	2712	6
211	Northeastern Mixed Forest	-0.1322	0.1287	4064	6.1
223	Central Interior Broadleaf Forest	-0.1967	0.2117	11828	5.2
221	Eastern Broadleaf Forest	-0.2257	0.1439	7550	5.7
232	Outer Coastal Plain Mixed Forest	-0.2448	0.0688	14585	7
M223	Ozark Broadleaf Forest - Meadow	-0.2519	0.1637	541.3	6.2
M231	Ouachita Mixed Forest - Meadow	-0.2691	0.1491	692.2	8.2
255	Prairie Parkland (sub-tropical)	-0.2902	0.363		
231	Southeastern Mixed Forest	-0.3221	0.0792	14683	6.2

Table 1. **FIA Analysis, from NCASI report. Negative numbers denote forest cover loss.** These estimates are from FIA data collected from 2006-2010. Data are compiled at the Baileys Province level. **FIA n** is the number of FIA plots in the ecoregion. **FIA Remper** is the weighted mean remeasurement period. These data were compiled by P. Van Deusen and T. Wigley from NCASI for the purposes of this study.

NCASI National Land Cover Dataset (NLCD) Analysis for FSC-US

Bailey's Ecoregion	Ecoregional description	Gross Change (%)	Net Change (%)	NLCD Forest Cover (ac)	FIA Forest Cover (ac)
242	Pacific Lowland Mixed Forest	-0.609	0.05	3498317	3099470
251	Prairie Parkland (temperate)	-0.124	-0.093	11862687	10447003
261	California Coastal Chaparral Forest and Shrub	-0.171	-0.133	2766708	996941
262	California Dry Steppe	-0.658	-0.193	190678	136470
263	California Coastal Steppe, Mixed Forest and Redwood Forest	-0.079	-0.033	3006567	2756441
313	Colorado Plateau Semidesert	-0.032	0.028	43026023	18866846
315	Southwest Plateau and Plains Dry Steppe and Shrub	-0.157	-0.088	53214128	34298326
321	Chihuahuan Semidesert	-0.046	-0.01	45926754	10969931
322	American Semidesert and Desert	-0.194	-0.168	49797172	2602122
331	Great Plains - Palouse Dry Steppe	-0.212	-0.06	26818591	7594754
332	Great Plains Steppe	-0.17	-0.064	2978213	2814467
341	Intermountain Semidesert and Desert	-0.091	-0.05	57539815	12710060
342	Intermountain Semidesert	-0.068	-0.018	73396679	6448592
M221	Central Appalachian Broadleaf Forest	-0.094	-0.063	30529369	29405988
M242	Cascade Mixed Forest - Coniferous Forest - Alpine Meadow	-0.422	-0.053	30359262	31080600
M261	Sierran Steppe - Mixed Forest - Coniferous Forest - Alpine Meadow Forest	-0.082	-0.044	32915123	30070465
M262	California Coastal Range Open Woodland - Shrub - Coniferous Forest - Meadow	-0.183	-0.155	7399917	2383144
M313	AZ & NM Mtn. Seidesert - Open Woodland Coniferous Forest - Alpine Meadow	-0.043	0.003	17671593	10285652
M331	So. Rocky Mtn. Steppe - Open Woodland - Coniferous Forest - Alpine Meadow	-0.047	-0.004	47380202	38050913
M332	Middle Rocky Mountain Steppe	-0.137	-0.028	35718186	28500480
M333	Northern Rocky Mountains Forest Steppe - Coniferous Forest - Alpine Meadow	-0.11	-0.06	21048620	19648210
M334	Black Hills Coniferous Forest	-0.06	0.105	2272354	1923382
M341	Intermountain Semidesert and Desert	-0.034	-0.006	29065494	13472599

Table 2. **Data from NCASI report. Negative numbers denote forest cover loss.** These estimates are from NLCD data collected from 2001-2006. Data are compiled at the Bailey's Province level. It is important to note that all of these data represent NLCD option 4 (includes woody wetlands and scrub cover classifications). **NLCD Forest Cover** and **FIA Forest Cover** are used as estimates of accuracy between the NLCD & FIA datasets. NCASI recommends using the NLCD estimates where the forest cover estimate most closely aligns with the FIA forest cover estimate. It should be noted that this preferred option will not always be NLCD option 4, but option 4 is reported here because it is the assumption model that most closely aligns with FSC-US assumptions.

FSC-US Staff Forest Inventory and Analysis (FIA) Analysis

Ecoregion	Net Change	Net Annual Change	Gross Annual Change	Initial Land Cover
Adirondack - Eastern Boreal Transition	-0.38%	-0.04%	-0.05%	741.6
Allegheny Highlands	-4.55%	-0.38%	-0.83%	2299.8
Appalachian Blue Ridge Forest	-2.31%	-0.19%	-0.47%	5536.6
Appalachian Mixed Mesophytic Forest	-3.42%	-0.28%	-0.55%	7399.8
Atlantic Coastal Pine Barren	-6.95%	-0.77%	-1.13%	191.4
Atlantic Coastal Plain	-0.43%	-0.03%	-0.10%	4699.1
Central Forest Grassland Transition	2.37%	0.21%	-0.67%	3081.4
Central US Hardwoods	3.61%	0.31%	-1.40%	6358.3
East Central Texas Forests	2.56%	0.26%	-0.36%	590.4
Eastern Great Lakes Lowland Forest	-5.54%	-0.62%	-1.05%	516.5
Everglades	29.07%	3.23%	-24.49%	95.6
Mississippi Lowland forest	6.05%	0.50%	-0.18%	1205.1
New England Acadian Forest	-2.18%	-0.18%	-0.28%	4338.8
Northeastern Coastal Forest	-2.53%	-0.23%	-0.75%	1603.1
Ozark Mountain Forest	1.76%	0.15%	-0.17%	1801.0
Piney Woods Forests	1.09%	0.11%	-0.18%	4369.8
Southeastern Conifer	0.56%	0.05%	-0.20%	6428.8
Southern Great Lakes	-0.17%	-0.01%	-0.91%	3468.2
Upper Midwest Forest Savanna Transition	7.37%	0.65%	-0.68%	3718.3
Western Great Lake Forests	0.72%	0.05%	-0.45%	13917.7

Table 3. **FSC-US Staff FIA Analysis.** Eastern ecoregional conversion estimates from FIA data (WWF ecoregions)**.** Land cover is represented in total number of FIA plots (each representing approximately 6,000 acres). Red text indicates small ecoregions with fewer than 400 plots, which have insufficient statistical power according to Van Deusen et. al. 2013.

FSC-US Staff National Land Cover Dataset (NLCD) Analysis

Ecoregion	Forest (F)	F & Woody Wetlands (WW)	F,WW,& Shrub/Scrub	F,WW,S/S, & Herbaceous	Initial Land Cover*
Arizona Montane	0.003%	-0.004%	-0.006%	**-0.006%**	54,689.2
Cascade Leeward	0.005%	-0.005%	-0.003%	**-0.004%**	9,833.1
Central and Southern Cascades	0.003%	0.003%	0.004%	**0.042%**	35,378.5
Central Pacific Coastal Forests	0.011%	**0.013%**	0.266%	0.316%	29,881.9
Colorado Rockies	-0.001%	0.004%	**-0.005%**	-0.006%	80,105.1
Eastern Cascades	0.000%	0.000%	0.024%	**0.023%**	28,491.9
Klamath Siskiyou Forests	0.000%	0.000%	0.004%	**0.004%**	33,065.4
North Central Rockies	-0.002%	-0.002%	0.006%	**0.006%**	78,363.1
Okanagan Dry Forests	-0.007%	-0.007%	-0.009%	**-0.018%**	8,988.8
Puget Trough	-0.147%	-0.154%	-0.120%	**-0.139%**	7,261.6
Sierra Nevada	0.000%		0.008%	**0.006%**	32,454.2
South Central Rockies	-0.001%	**0.000%**	0.003%	0.005%	82,217.2
Wasatch and Unita	-0.002%	**-0.003%**	0.004%	0.004%	27,168.8

Table 4. **FSC-US staff analysis** of western ecoregion conversion estimates based on NLCD data, **FSC-US** analysis. Bold estimates in box are the best estimate for the given ecoregion based on the nature of that ecoregion

VI. Annex B – Plantation Guidance from the FSC US Forest Management Standard

PLANTATION CLASSIFICATION (PRINCIPLE 10)

Guidance on the classification is provided in three parts:

1) guidance on the classification of plantations;
2) guidance on ***principle characteristics and key elements of native forest ecosystems***;
3) guidance on management practices related to plantations.

Guidance on the classification of plantations:

From the definition of plantation it is clear that the presence of most of the ***principal characteristics and key elements of native forest ecosystems*** is primary to discerning natural or semi-natural forests from plantations. Therefore, a "planted forest" is not necessarily a "plantation" (as defined in this standard) since it may have most of the ***principle characteristics and key elements of native forest ecosystems*** indigenous to an area. Additionally, given that the intensity of management activities may influence the presence of these characteristics and traits, classification of a forest stand as a plantation should be based on the presence or absence of these characters and elements.

As stated in the definition, there are three situations, except for highly extenuating circumstances, where planted forests are considered plantations. In all other cases, a forest must be determined to be natural or a plantation depending upon the degree to which it has and provides the ***principal characteristics and key elements of native forest ecosystems*** as compared to a natural stand of similar forest type and development stage. Further, to the extent that a particular forest does NOT hold these attributes, it must be clear that the absence of the attributes is a result of silviculture treatments. Silvicultural treatments that could contribute to the absence of native forest ecosystem attributes and the characterization of a stand as a plantation are listed later in this appendix under the section "**Guidance on Management Practices Related to Plantations"**.

Since almost all of the noted characteristics and elements are very difficult to measure directly, especially in the short time frame of an audit, forest managers and CBs must use professional judgment to evaluate sites for these characteristics and elements as well as keep abreast of research that is designed to specifically measure the effects of various silviculture treatments on these attributes. Forest managers should be prepared to provide the results of research appropriate to their forest types and forest management practices.

This guidance must be used for both short-term certification evaluations and as the basis for the development of more detailed guidance specific to forest types.

Guidance on *principle characteristics and key elements of native forest ecosystems*:

The term "***principle characteristics and key elements of native forest ecosystems***" refers to the suite of characteristics that are to be used to distinguish ***natural forests*** and ***semi-natural forests*** from plantations for the purpose of application of this standard. These characteristics are dependent on the forest type/forest habitat type, temporal nature of forest stand development, and the past management history of the site. In the context of the progressing stage of stand

development (e.g., stand initiation, stem exclusion, understory reinitiation, and old growth – per *Oliver and Larson 1996*) there are *principle characteristics* of natural forests, which are not present in plantations. This approach is based on the generalization that native forest ecosystems are also typically characterized by survival through at least the mid-development (understory reinitiation) stage, given allowances for historic range of natural variation. These characteristics include:

- tree species composition consistent with the concomitant stage of native forests types occurring on similar sites; understory plant community species abundance and distribution consistent with the concomitant stage of stand development for native forests types occurring on similar sites;
- genetic diversity within planted tree species, as represented across the FMU, consistent with natural genetic diversity.

- *within-stand structural diversity*:

    - stands are managed to mid-development stages (e.g. understory reinitiation stage);

    - tree morphology (size and shape) associated with the concomitant stage of stand development for native forests types occurring on similar sites;

    - variability in tree density and spacing and age class distribution consistent with the natural disturbance regimes of the region;

    - understory plant community structure and density consistent with the concomitant stage of stand development for native forests types occurring on similar sites;

    - snags, den trees, and downed woody debris consistent with the stage of stand development and disturbance regimes for native forests types occurring on similar sites;

    - small patch disturbances, too small to be considered a "stand" by themselves, to provide structural diversity;

- *between-stand structural diversity:*

    - diversity in the stages of development between stands ranging from the stand initiation stage to at least the understory reinitiation stage;

    - representative variation in intensity and scale of disturbances consistent with native forest types on similar sites (e.g. fire, windthrow, disease, insects)

Collectively, these characteristics are considered definitive for native forest ecosystems throughout the US. However, the quantitative representations of each of these characteristics on a given site exist along a spatial and temporal continuum ranging from abundant to marginally present depending on the forest type, stage of development, the range of natural variation associated with the forest type, and the past management history. This intent should be used as a framework to guide regional decision- making in lieu of additional FSC-US guidance specific to regions and forest types.

Guidance on Management Practices Related to Plantations: Management practices that could contribute to the absence of native forest ecosystem attributes and the characterization of a stand as a plantation include:

- rotation lengths short enough to prevent stands from development into understory reinitiation stages;
- systematic use of, and reliance on, chemical herbicides, pesticides and fertilizers;
- Intensive chemical or mechanical site preparation;
- through planting, thinning, or other management practices, a single species is maintained as the primary forest type on sites normally occupied by multiple-species forests;
- use of even-aged silviculture for forest types that do not typically or regularly regenerate as even-aged stands naturally through stand-replacing events;
- preclusion of successional pathways; *FSC-US Forest Management Standard Page 108 of 109*
- use of a silviculture system which purposefully results in a stand with dominant tree species different than dominant species representative of the native ecosystem that existed historically.
- use of even-aged regeneration units that lack retention, and are uncharacteristic of the natural disturbance regimes referred to in Criterion 6.3;
- use of a silviculture system which shift the species composition away from natural historic regime.