

FSC National Risk Assessment

For the conterminous United States of America (annexes)

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| International contact | Name: Amy Clark Eagle Email address: a.eagle@us.fsc.org |
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Annex A Glossary

In some instances, the US Forest Management (FM) Standard definitions are included here as guidance. However, for the purposes of the National Risk Assessment, the primary definitions provided below are to be considered normative. Differences between these definitions and the FM certification definitions are due to the different purposes served at different scales.

Control Measure (CM): An action that the organization shall take in order to mitigate the risk of sourcing material from unacceptable sources. (Source: FSC-STD-40-005 V3-1)

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

Low Risk: A conclusion, following a risk assessment, that there is negligible risk that material from unacceptable sources can be sourced from a specific geographic area. (Source: FSC-PRO-60-002a V1-0)

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, dominance by large overstory legacy (i.e. pre European settlement) trees, and a high incidence of large snags, trees with broken tops, and very large coarse 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.

Permanently Protected: For the purposes of this National Risk Assessment (NRA), these are lands where the management intent is equivalent to Status 1 or Status 2 of the GAP Status Codes, as defined in the data standards for the Protected Areas Database-US (<http://gapanalysis.usgs.gov/padus/data/standards/>).

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. For example, federally designated wilderness areas and areas protected under State legislation with similar goals and restrictions.

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. For example, National Parks, National Wildlife Refuges, Research Natural Areas, local conservation areas and private conservation land, but not National Forests, State-administered lands, historical/cultural areas, etc.

NOTE The USGS maintains a GAP Protected Areas Viewer application that presents those GAP Status 1-4 areas that have been inventoried: <http://gapanalysis.usgs.gov/padus/viewer/>

Plantation: Forest areas lacking most of the principal characteristics and key elements of native ecosystems as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of either planting, sowing or intensive silvicultural treatments (source: FSC-STD-01-001).

The use of establishment or subsequent management practices in planted forest stands that perpetuate the stand-level absence of most principle characteristics and key elements of native forest ecosystems will result in a stand being classified as a plantation. The details addressing ecological conditions used in stand-level classification are outlined in related guidance. Except for highly extenuating circumstances the following are classified as plantations:

- cultivation of exotic species or recognized exotic sub-species;
- 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;
- cultivation of any tree species in areas that were naturally non-forested ecosystems.

See Appendix G of the FSC US Forest Management Standard for: 1) guidance on the classification of plantations; 2) guidance on principle characteristics and key elements of native forest ecosystems; and 3) guidance on management practices related to plantations.

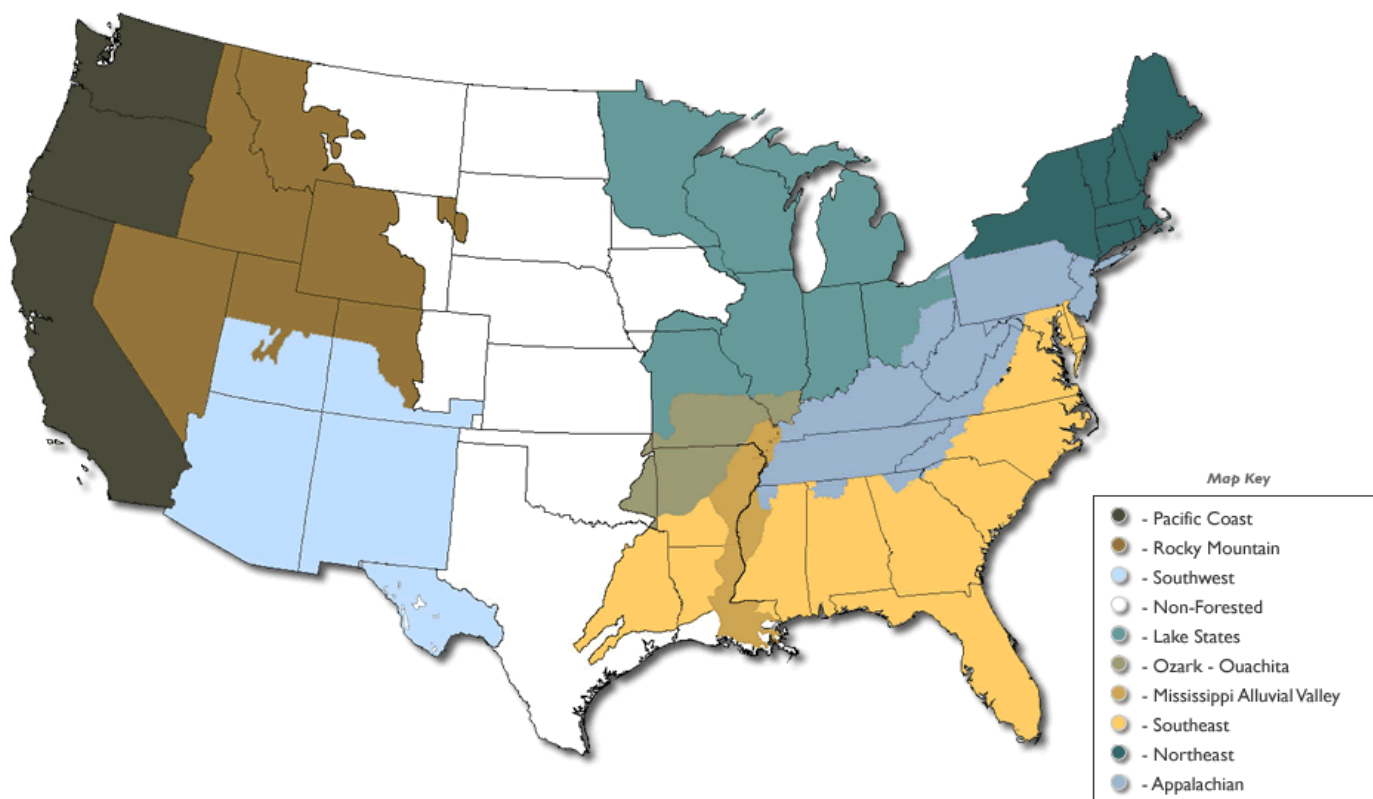
Primary Forest: Forest that has not historically been subject to commercial logging, and has historically been maintained in a forested condition. Forest that has encroached on lands not previously forested is not considered primary. Primary forest includes Type 1 Old-Growth.

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 material 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. (Source: FSC-PRO-60-002a V1-0)

Annex B FSC US Regional Map



NOTE: A spatial data layer with boundaries for the above regions may be requested by contacting the FSC US office.

Annex C Risk Designations by FSC US Region

This annex provides a summary of risk designation decisions by FSC US Region (see Annex B for a map of FSC US Regions). A 'Specified' notation below indicates that there is specified risk designated within the region, but not the entire region. This table is for general reference only – the normative risk designations are provided in the main document.

| FSC US Region | Category 1: Legality | Category 2: Traditional & Human Rights | Category 3: High Conservation Values | | | | | | Category 4: Conversion | Category 5: Genetically Modified Organisms |
|-----------------------------|-------------------------|--|--------------------------------------|--|------------------------------|---|------------------------------|------------------------------|---------------------------|---|
| | | | HCV 1: Species Diversity | HCV 2: Landscape- Level Forests | HCV 3: Rare Ecosystems | HCV 4: Critical Ecosystem Services | HCV 5: Community Needs | HCV 6: Cultural Values | | |
| Pacific Coast | Low | Low | Specified ¹ | Low | Specified ⁴ | Low | Low | Low | Specified ⁹ | Low |
| Rocky Mountains | Low | Low | Low | Low | Specified ⁵ | Low | Low | Low | Low | Low |
| Southwest | Low | Low | Low | Low | Low | Low | Low | Low | Low | Low |
| Non-Forested | Low | Low | Low | Low | Low | Low | Low | Low | Low | Low |
| Great Lakes | Low | Low | Low | Low | Low | Low | Low | Low | Low | Low |
| Northeast | Low | Low | Low | Low | Low | Low | Low | Low | Low | Low |
| Appalachian | Low | Low | Specified ² | Low | Specified ⁶ | Low | Low | Low | Low | Low |
| Ozark-Ouachita | Low | Low | Low | Low | Low | Low | Low | Low | Low | Low |
| Mississippi Alluvial | Low | Low | Low | Low | Specified ⁷ | Low | Low | Low | Low | Low |
| Southeast | Low | Low | Specified ³ | Low | Specified ⁸ | Low | Low | Low | Specified ¹⁰ | Low |

¹ Critical Biodiversity Area: Central California, Klamath-Siskiyou
Species: Lesser Slender Salamander

² Critical Biodiversity Area: Central Appalachians, Southern Appalachians
Species: Cheoah Bald Salamander

³ Critical Biodiversity Area: Southern Appalachian, Cape Fear Arch, Florida Panhandle, Central Florida
Species: Dusky Gopher Frog, Houston Toad, Patch-nosed Salamander

⁴ Old Growth Forest

⁵ Old Growth Forest

⁶ Priority Forest Type: Mesophytic Cove Sites

⁷ Priority Forest Type: Late Successional Bottomland Hardwoods

⁸ Priority Forest Type: Late Successional Bottomland Hardwoods, Native Longleaf Pine Systems

⁹ Specific counties in Washington and Oregon

¹⁰ Specific counties in Texas, Alabama, Florida, Georgia, South Carolina, North Carolina, Virginia and Delaware

Annex D Assessments for Category 2

This annex is intended to provide the Category 2 assessment in a more accessible format than the required National Risk Assessment template in the main document. Additionally, it includes available guidance that is not included in the main document which is intended to help readers better understand the rationale behind the risk designation decisions for Category 2 indicators. For any category with an associated annex, the content found in the main body of the risk assessment, not the annex, is definitive.

A draft Centralized National Risk Assessment (CNRA) for the entire United States was completed for Category 2 by a consultant on behalf of FSC International. A public consultation was completed on the CNRA in 2015, but it was not approved, nor formally published. FSC US staff subsequently completed an evaluation of the draft CNRA content and additional assessments (including consultation with an expert on Indicator 2.3), which were presented to the working group for their review. The content from the draft CNRA has been combined with the additional assessments completed, and they are presented together below.

Category 2 – Traditional and Human Rights

FSC considers materials that come from places where traditional and human rights are being violated due to management activities (harvesting, processing and trading) to be unacceptable materials. Therefore, the NRA assesses the risk of sourcing from these kinds of areas.

Global Context

The following summary is intended to help contextualize information from other sources associated with each of the specific risk assessment indicators. Internet searches were performed to look for data on level of corruption, governance, lawlessness, fragility of the State, freedom of journalism, freedom of speech, peace, human rights, armed or violent conflicts by or in the country, etc.

The United States scores well or very well on global indices and indicators related to: governance, regulatory enforcement, failed and fragile states, corruption, freedom in the world, freedom of the press and freedom of the net [Sources: 1,4,9,12,13,14,16]. On one index of the state of peace, the United States scores ‘medium’ due to more recent violence (e.g., the Boston Marathon bombings), a high degree of militarization and a high incarceration rate [Source: 15]. The United States is not included on lists of countries with: fragile situations and impunity concerns (specific to journalism) [Sources: 2,3]. ‘Watchdog’ organizations do not identify concerns with illegal logging or timber conflicts in the US [Sources: 6,7,8,10], but are mixed on concerns about human rights. Some watchdog groups do not identify any concerns with human rights [Sources: 6,7], while others identify concerns with criminal justice, immigration, national security, drug policy, child labor on US farms, discrimination against workers with family responsibilities, and excessive force in domestic law enforcement [Sources: 5,11].

Sources of Information:

1. World Bank: Worldwide Governance Indicators - the WGI report aggregate and individual governance indicators for 215 countries (most recently for 1996–2012), for

six dimensions of governance: Voice and Accountability; Political Stability and Absence of Violence; Government Effectiveness; Regulatory Quality; Rule of Law; Control of Corruption. Retrieved from <http://info.worldbank.org/governance/wgi/index.aspx#home>

2. World Bank Harmonized List of Fragile Situations. FY11. Retrieved from http://siteresources.worldbank.org/EXTLICUS/Resources/511777-1269623894864/Fragile_Situations_List_FY11_%28Oct_19_2010%29.pdf
3. Committee to Protect Journalists: Impunity Index - CPJ's Impunity Index calculates the number of unsolved journalist murders as a percentage of each country's population. For this index, CPJ examined journalist murders that occurred between January 1, 2004, and December 31, 2013, and that remain unsolved. Only those nations with five or more unsolved cases are included on this index. Retrieved from <http://cpj.org/reports/2014/04/impunity-index-getting-away-with-murder.php>
4. Carleton University: Country Indicators for Foreign Policy: the Failed and Fragile States project of Carleton University examines state fragility using a combination of structural data and current event monitoring. Retrieved from <http://www4.carleton.ca/cifp/ffs.htm>
5. Human Rights Watch. Retrieved from <http://www.hrw.org>
6. US AID - Search on website for [country] + 'human rights' 'conflicts' 'conflict timber.' Retrieved from <http://www.usaid.gov>
7. Global Witness - Search on website for [country] + 'human rights' 'conflicts' 'conflict timber.' Retrieved from <http://www.globalwitness.org>
8. World Wildlife Fund. Illegal logging. Retrieved from http://wwf.panda.org/about_our_earth/about_forests/deforestation/forest_illegal_logging/
9. Transparency International. Corruption Perceptions Index. Retrieved from <http://cpi.transparency.org/cpi2013/results/>
10. Chattam House. Illegal Logging Indicators Country Report Card. <http://www.illegal-logging.info>
11. Amnesty International Annual Report: The state of the world's human rights - information on key human rights issues, including: freedom of expression; international justice; corporate accountability; the death penalty; and reproductive rights
12. Freedom House. Retrieved from <http://www.freedomhouse.org/>
13. Reporters without Borders: Press Freedom Index. 2013. Retrieved from http://en.rsf.org/spip.php?page=classement&id_rubrique=1054
14. Fund for Peace - Failed States Index of Highest Alert - the Fund for Peace is a US-based non-profit research and educational organization that works to prevent violent conflict and promote security. The Failed States Index is an annual ranking, first published in 2005, of 177 nations based on their levels of stability and capacity. In 2014 the FFP changed the name of the Failed State Index to the Fragile State Index. Retrieved from <http://ffp.statesindex.org/rankings-2013-sortable>
15. The Global Peace Index. Published by the Institute for Economics & Peace, This index is the world's leading measure of national peacefulness. It ranks 162 nations according to their absence of violence. It's made up of 23 indicators, ranging from a nation's level of military expenditure to its relations with neighboring countries and the level of respect for human rights. Source: The Guardian. Retrieved from <http://www.visionofhumanity.org/#/page/indexes/global-peace-index>
16. World Justice Project. Rule of Law Index 2016. Retrieved from <http://data.worldjusticeproject.org/#groups/USA>

INDICATOR 2.1: CONFLICT TIMBER

“The forest sector is not associated with violent armed conflict, including that which threatens national or regional security and/or linked to military control.”

Context and Considerations (from FSC-PRO-60-002a)

- Is the country covered by a UN security ban on exporting timber?
- Is the country covered by any other international ban on timber export?
- Are there individuals or entities involved in the forest sector that are facing UN sanctions?
- Is the area a source of conflict timber?
- Is the conflict timber related to specific operators? If so, which operators or types of operators?

Assessment:

There is no UN Security Council ban on timber exports from the United States [Sources: 17,18,19]. The United States is not covered by any other international ban on timber export [Sources: 17,18,19]. There are no individuals or entities involved in the forest sector in The United States that are facing UN sanctions [Sources: 17,18,19]. There is no evidence of conflict timber concerns within the United States [Sources: 18,20,21,22,23,24].

Low Risk Thresholds that Apply:

- (1) The area under assessment is not a source of conflict timber; AND
- (2) The country is not covered by a UN security ban on exporting timber; AND
- (3) The country is not covered by any other international ban on timber export; AND
- (4) Operators in the area under assessment are not involved in conflict timber supply/trade; AND
- (5) Other available evidence does not challenge a ‘low risk’ designation.

Indicator 2.1 Risk Designation: Low Risk for the entire assessment area

Sources of Information:

17. United Nations. Compendium of United Nations Security Council Sanctions Lists. Retrieved from http://www.un.org/sc/committees/list_compend.shtml
18. US AID. Retrieved from <http://www.usaid.gov>
19. Global Witness. Retrieved from <http://www.globalwitness.org>
20. Human Rights Watch. Retrieved from <http://www.hrw.org/>
21. Amnesty International Annual Report: The state of the world’s human rights - information on key human rights issues, including: freedom of expression; international justice; corporate accountability; the death penalty; and reproductive rights. Retrieved from <http://amnesty.org/en/annual-report/2013/>
22. World Bank: Worldwide Governance Indicators - the WGIs report aggregate and individual governance indicators for 213 economies (most recently for 1996–2010), for six dimensions of governance: Use indicator 'Political stability and Absence of violence' specific for indicator 2.1. Retrieved from <http://info.worldbank.org/governance/wgi/index.aspx#home>
23. Greenpeace. Retrieved from <http://www.greenpeace.org>
24. Center for International Forestry Research. Forests and Conflict. Retrieved from http://www.cifor.org/publications/Corporate/FactSheet/forests_conflict.htm

INDICATOR 2.2: LABOR RIGHTS

“Labor rights are upheld including rights as specified in ILO Fundamental Principles and Rights at Work. “

Relevant Indicators from the Category 1 (Legality) Centralized National Risk Assessment:

- *Indicator 1.11 (Health and Safety):* Low Risk at the national level
- *Indicator 1.12 (Legal Employment):* Low Risk at the national level

Context and Considerations (from FSC-PRO-60-002a)

- Are social rights covered by relevant legislation and enforced in the country or area concerned? (refer to Category 1)
- Are rights like freedom of association and collective bargaining upheld?
- Is there evidence of occurrences of compulsory or forced labor?
- Is there evidence of occurrences discrimination?
- Is there evidence of occurrences of child labor?
- Is the country signatory to the relevant ILO Conventions or are the ILO Fundamental Rights and Principles at work upheld?
- Is there evidence that any groups (including women) feel adequately protected related to the rights mentioned above?
- Are any violations of labor rights limited to specific sectors?

Assessment:

General Social Rights

The Declaration on Fundamental Principles and Rights at Work reads as follows [Source: 25]:

“All ILO Members, even if they have not ratified the Conventions in question, have an obligation arising from the very fact of membership in the Organization to respect, to promote and to realize, in good faith and in accordance with the Constitution, the principles concerning the fundamental rights which are the subject of those Conventions, namely:

- a) freedom of association and the effective recognition of the right to collective bargaining;
- b) the elimination of all forms of forced or compulsory labour;
- c) the effective abolition of child labour; and
- d) the elimination of discrimination in respect of employment and occupation.”

This indicator specifically addresses whether the country being assessed upholds the ILO Fundamental Principles and Rights at Work – which may be demonstrated by ratification of the 8 relevant ILO Core conventions, or using other evidence. Therefore, the fact that the United States has not ratified all 8 of the Conventions does not automatically infer that the country is not in compliance with the indicator.

The United States has extensive legislation protecting the social rights of individuals and workers. The following pieces of the US legal framework uphold the ILO Fundamental Principles and Rights of Work in the United States:

- The First Amendment to the United States Constitution, adopted in 1791, provides that “Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press, or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances”. In practice, this means that the Constitution protects employees’ rights of association, thereby prohibiting their discharge for union activity.
- Freedom of association in the US is protected by the 1935 National Labor Relations Act (NLRA; 29 USC §151-169), with primary responsibility for enforcement by the National Labor Relations Board (NLRB). Additionally, the US Code (29 USC §171(a)) states that, “it is the policy of the United States that, “sound and stable industrial peace and the advancement of the general welfare, health, and safety of the Nation and of the best interests of employers and employees can most satisfactorily be secured by the settlement of issues between employers and employees through the processes of conference and collective bargaining between employers and the representatives of their employees”
- Forced and compulsory labor is prohibited by the 13th Amendment to the United States Constitution, and is codified in 18 USC § 1589. The amendment specifically outlaws slavery and involuntary servitude, except as punishment for a person duly convicted of a crime
- The Trafficking Victims Protection Act (most recently reauthorized in 2013) authorizes measures to combat human trafficking. Additionally, federal legislation requires every employer to pay each employee a minimum wage (29 U.S.C. § 206) and overtime pay (29 U.S.C. § 207).
- The Fair Labor Standards Act of 1938 (29 USC § 201-262) restricts the employment of children under the age of 16 with the exception of children working on farms owned by their parents, and forbids the employment of people younger than 18 in jobs deemed too dangerous (including logging).
- Discrimination with respect to employment is prohibited in the United States by Section VII of the Civil Rights Act of 1964 (Public Law 88-352), and is overseen by the U.S. Equal Employment Opportunity Commission. There are several additional and complementary pieces of legislation, such as: the Equal Pay Act of 1963 (EPA), which protects men and women who perform substantially equal work in the same establishment from sex-based wage discrimination; the Age Discrimination in Employment Act of 1967 (ADEA), which protects individuals who are 40 years of age or older; Title I and Title V of the Americans with Disabilities Act of 1990, as amended (ADA), which prohibit employment discrimination against qualified individuals with disabilities in the private sector, and in state and local governments; Sections 501 and 505 of the Rehabilitation Act of 1973, which prohibit discrimination against qualified individuals with disabilities who work in the federal government;

All indicators in the Category 1 (legality) assessment were designated as ‘low risk’ at a national scale, indicating that the relevant legislation is enforced.

Freedom of Association & Collective Bargaining

Even though the US has not ratified either of the associated Core Conventions, it has been a member of the ILO since 1980 (and previous to that was a member from 1934 to 1977). As a member, the US has obligations under the ILO Constitution, including a commitment under the Declaration on Fundamental Principles and Rights at Work. [Source: 26] Additionally, the US is subject to annual ILO review and reporting processes and also complaint processes (through the Committee on Freedom of Association, CFA). A report by the International Organisation of Employers (IOE) notes that “Most CFA case examinations of U.S. law have resulted in conclusions and recommendations that the law or practice subject of the complaint is consistent with the principles of freedom of association” and that “there has never been a wholesale criticism of the NLRA or NLRB by the CFA or the ILO” [Source: 27]. There are 42 closed complaints cases listed in the US member profile [Source: 26]. All of this provides strong evidence that the United States respects, promotes and realizes, in good faith, workers’ rights to “freedom of association and the effective recognition of the right to collective bargaining.”

Some sources question whether the United States is truly respecting workers’ rights to freedom of association and the effective recognition of the right to collective bargaining. Concerns include the exemption of a small number of worker categories (such as agricultural workers) from the NLRA [Source: 28,29,30,31], the ability of employers to hire replacement workers for those on strike [Source: 31], the perceived ability of employers to pressure employees against organizing in the workplace [Source: 31], the predominance of enterprise-level bargaining [Source: 9], the perceived lack of fair election processes [Source: 30], and the perceived lack of adequate enforcement [Source: 31].

- While the NLRA is an important piece of legislation that protects workers’ rights, it is not the only source of protection for workers in the US. The Member profile for the United States lists 80 separate pieces of national legislation associated with ‘Freedom of association, collective bargaining and industrial relations’ [Source: 26]. As noted above, the constitution itself protects the rights of all workers to associate and the US Code establishes in federal policy the respect of the country for collective bargaining – both of these cover all workers, regardless of whether they are covered by the NLRA. Additionally, in the 2003-2005 US Annual Reports to the ILO, the Government writes, “No Government’s authorization is required to establish a workers’ organization, or to conclude collective agreements. The exercise of freedom of association and the right to collective bargaining is recognized at enterprise, sector/industry, national (and international) levels for the following categories of workers: (i) medical professionals; (ii) teachers; (iii) agricultural workers; (iv) workers engaged in domestic work; (v) workers in export processing zones (EPZs) or enterprises/industries with EPZs status; (vi) migrant workers; (vii) workers of all ages; and (viii) workers in the informal economy.” [Source: 28]
- US labor relations are different than those in other parts of the world. A predominance of enterprise-level bargaining reflects these differences, but does not indicate that collective bargaining is not respected, just that it is done differently. Employers have rights in the US that are different from other countries, including being allowed to actively communicate with employees during collective bargaining, but again this does not indicate that collective bargaining is not respected. While employers are allowed to hire replacement workers so that they may remain in business during strikes, they are required by law to bargain in good faith to resolve those strikes. [Source: 34]
- Concerns about election processes do not take into account (and were published prior to) recent changes in union election procedures that are universally considered to favor unions [Sources: 35,36]. It also fails to consider that, according to election

statistics, unions are successful in approximately 70% of the elections that are held [Source: 37].

- There is a very robust system for enforcement of these rights. On the federal level, they are guaranteed by the NLRA, which protects the rights of employees and employers, “to encourage collective bargaining, and to curtail certain private sector labor and management practices, which can harm the general welfare of workers, businesses and the U.S. economy.” [Source: 38] The Act also established the National Labor Relations Board (NLRB), which has primary responsibility for enforcement of the NLRA. Each year, approximately 20,000 charges are filed with the NLRB alleging unfair labor practices, and each one is investigated by regional field examiners and attorneys. More than half of these are withdrawn or dismissed, and of those that receive full investigation, a little over 1,000 each year result in formal complaints detailing the alleged violations. After a decision by a judge, the remaining cases are litigated and reviewed by the NLRB itself each year [Source: 39]. The US Annual Reports to the ILO summarize the millions of dollars that have been repaid to workers as a result of these enforcement actions [Source: 28]. This represents a heavily utilized and strong enforcement system.

In its 2017 report, the International Trade Union confederation (ITUC) categorizes the US as a Status 4 (Systemic violations of rights) in its annual index [Source: 32]. The categorization is based upon surveys of national unions and review of legislation and then comparison of these results with 97 indicators derived from the ILO Conventions and jurisprudence that represent violations of workers’ rights. The primary concerns highlighted in the 2017 report were lack of consultation with unions regarding labor law and policy, and limits on certain types of strike actions.

- This index is based on the opinion of the unions, not metrics, and the views of employees and employers are not included.
- Other global indices and indicators that address labor rights recognize the US as being above the median [Sources: 39,70]
- The status categorization within this index is built upon indicators that are drawn from the ILO Conventions, but as noted by ILO itself, ratification of and conformance with the Conventions is not required for respect of the Fundamental Principles and Rights [Source: 25], and it is the Fundamental Principles and Rights that are the focus of Indicator 2.2 for this risk assessment. Therefore, lack of complete alignment with the Conventions and a lower status in this index does not *per se* indicate that the US does not respect the basic rights of association and collective bargaining.
- The issues highlighted in the report (e.g., consultation with unions regarding labor law and policy, and limits on certain types of strike actions) provide no information regarding whether the US respects the basic rights of association and collective bargaining.
- Therefore, it is still possible for the US to respect the Fundamental Principles and Rights, while being categorized with a lower status in this index.

It is possible to conclude from the information presented that while the US has not ratified and may not conform with all specifics in the associated Core Conventions, it respects the fundamental rights of freedom of association and the effective recognition of the right to collective bargaining.

Compulsory or Forced Labor

The US ratified Core Convention 105 (Abolition of Forced Labour Convention) in 1991 and the ILO web site indicates the status as 'In Force' [Source: 26]. The US has not yet ratified Convention 29 (Forced Labour Convention), but as noted above has legislation that addresses fundamental rights associated with compulsory or forced labor. There are also numerous additional policies, reports, action plans and executive orders that provide evidence of the country's efforts to ensure these rights, particularly as they relate to human trafficking [Source: 28].

The United States is consistently categorized as Tier 1 (the highest tier reflecting a country's efforts to address human trafficking problems) in the U.S. Department of State's Trafficking in Persons annual report [Source: 40]. The Global Slavery Index's 2016 assessment identifies the United States as a country with one of the lowest estimated prevalence of modern slavery and as a country with one of the strongest responses to modern slavery [Source: 41].

Some sources identify the situation of migrant workers in the agricultural sector as an area of concern [Sources: 42,43,44]. The agricultural sector is important for this assessment, as it includes both farmworkers and forest workers.

- One of the sources is an ILO report on forced labor [Source: 42]. The report is 57 pages in length and the United States is mentioned in a single paragraph within a section on the Agricultural, forestry and fishing sector. The US is identified as an example of a country with a high population of migrant and seasonal farmworkers. The report acknowledges that a high share of migrant workers is reflected in the number of cases of forced labour in the sector as a whole (globally), but does not indicate that the US is of specific concern.
- One of the sources identified is Anti-Slavery International, the world's oldest international human rights organization [Source 43]. While this organization has awarded organizations that are fighting forced labor in the United States agricultural sector, it does not identify the United States as a country in which they focus their anti-slavery efforts and a search of 'United States' at the web site does not bring up any reports or other articles about specific concerns in the US or the US in general. Additionally, Anti-Slavery International recognizes the US Department of State's Trafficking in Persons Report (see above) as a valid global index of human trafficking and efforts to eliminate it.
- One of the sources is an article written for an online topical research digest hosted by the University of Denver [Source: 44]. The article notes a high occurrence of forced labor in the US, but does not provide any data or specific references as evidence. It states that the high occurrence is due to the absence of labor standards and regulations in the industry, and to the increasing number of undocumented immigrant farm workers that have no legal protection. The article recognizes the importance of the Trafficking Victims Protection Act and some limitations, but was written prior to reauthorizations of the act that increased the protections that it provides. However, the article does not recognize the Migrant and Seasonal Agricultural Worker Protection Act which is the principle federal employment law for farmworkers in the US [Source: 45].
- Perhaps most pertinently, these sources focus almost entirely on farmworkers, which are one component of the agricultural sector. However, forest workers are a separate component of the agricultural sector, but are not specifically addressed in these sources. While the 2017 Trafficking of Persons report [Source: 40] does identify forced labor in the forestry sectors of Burma, Czechia, Guyana, Mongolia, Sweden, and Uganda, and the 2016 List of Goods Produced by Child Labor or

Forced Labor [Source: 46] identifies forced labor for timber in Brazil, North Korea, and Peru, the US is not mentioned in association with forestry or timber in either report.

While the US has not ratified both relevant Core Conventions, it is still possible to conclude that the US respects the fundamental right to the elimination of all forms of forced or compulsory labor, and in particular that there are no concerns identified in the forest sector.

Child Labor

The United States ratified Core Convention 182 (Worst Forms of Child Labor Convention) in 1999 and the ILO web site indicates the status as 'In Force' [Source: 26]. The US has not yet ratified Convention 138 (Minimum Age Convention), but as noted above has legislation that addresses fundamental rights associated with child labor. Additionally, every state has legislation that further limits the hours and days per week that minors may work in non-farm employment and 34 states have similar limits for farm work [Source: 47]. And all states have compulsory education until at least 16 years of age [Source: 28]. The US Annual Reports to the ILO also detail statistics on the effective enforcement of the federal legislation, including hundreds of cases, thousands of children affected and millions of dollars paid in fines each year [Source: 28].

The United States does not feature in the ILO Child Labour Country Dashboard, which indicates a low risk for child labour in the United States [Source 53]. The 2016 List of Goods Produced by Child Labor or Forced Labor [Source: 46] does not associate any goods produced in the US with child labor.

Some sources identify the situation of children in the agricultural sector as an area of concern [Sources: 43,48,49,50,51,52]. The agricultural sector is important for this assessment, as it includes both farmworkers and forest workers. However, the focus of all of these sources are exemptions in the US legislation that allow children under the age of 16 to work on family farms, and does not in any way include children working in forests. The US Labor legislation clearly prohibits the employment of minors between 16 and 18 years of age in forestry service occupations and associated occupations as they are "occupations particularly hazardous or detrimental to [the minors'] health or well-being" [Source: 54]. No sources of information were identified that suggest that child labor in the forest sector is a concern.

While the US has not ratified both relevant Core Conventions, it is still possible to conclude that the US respects the fundamental right to the effective abolition of child labor, particularly in the forest sector.

Discrimination

Even though the US has not ratified either of the associated Core Conventions, it has been a member of the ILO since 1980 (and previous to that was a member from 1934 to 1977). As a member, the US has obligations under the ILO Constitution, including a commitment under the Declaration on Fundamental Principles and Rights at Work. Additionally, the US is subject to annual ILO review and reporting processes. [Source: 26]

As noted above, the US has a suite of federal laws that prohibit discrimination in the workplace, including discrimination based on race, color, religion, sex, national origin, gender, age, pregnancy, disability, gender identity, sexual orientation, and genetic information. The Equal Employment Opportunity Commission (EEOC) is responsible for enforcement of these laws. In 2015, the EEOC received 89,385 private sector charges of discrimination and achieved 92,641 resolutions, including more than \$356.6 million in monetary benefits [Source: 59].

Some sources question whether the United States is truly respecting workers' rights to elimination of discrimination. Concerns include differences in unemployment rates between African Americans and whites [Source: 55,56], wage gaps between races and genders [Sources: 56,57], discrimination against workers with family responsibilities [Sources: 49,56,58], slow progress on affirmative action, an increase in religious discrimination and age discrimination claims, and wage gaps and unemployment rate gaps for persons with and without disabilities [Source: 56].

- The US generally scores well or very well on global indices and reviews of gender equality in the workplace [Sources: 60,61], on social progress [Source: 38], fundamental rights (including discrimination) [Source: 63], and discrimination in employment & vocational training [Source: 64]
- Conclusions about racial, gender, religious, age and other discrimination cannot be drawn from simple statistics such as wage and unemployment gaps without delving deeper into the issues. FSC-GUI-60-008 (V1-0) states, "Concerning non-discriminatory employment and occupation practices, the working group clarified that differences in remuneration between workers are not considered discriminatory where they exist due to inherent requirements or specifics of the job, e.g. due to length of employment, experience, technical expertise and performance" [Source: 68]. There must be recognition or consideration of the many different factors that may contribute to employment differences where they do exist. For example, research results indicate that a majority of racial and gender wage gaps in the US can be explained by differences in education, labor force experience, occupation or industry and other factors that can be measured [Source: 67]. Therefore, while lack of a wage or unemployment gap could be used as evidence that discrimination does not exist, existence of a gap does not automatically infer that the US does not respect the fundamental right to the elimination of discrimination.
- In recent years, the US has significantly improved protections for workers with family responsibilities, including the 2010 Patient Protection and Affordable Care Act that amended the Fair Labor Standards Act to require that employers provide break time for nursing mothers [Source: 65], and the Family and Medical Leave Act of 1993 that requires the provision of leave time for family reasons (i.e., maternity/paternity leave) and for medical reasons [Source: 66]. A number of the sources with concerns were published prior to implementation of these new laws.
- No sources of information were identified that suggest that any form of discrimination related to race, religion, disability or age in the forest sector is a concern.

It is possible to conclude from the information presented that while the US has not ratified and may not conform with all specifics in the associated Core Conventions, it respects the fundamental rights of the elimination of discrimination in respect of employment and occupation, particularly in the forest sector.

Low Risk Thresholds that Apply:

- (10) Applicable legislation for the area under assessment covers all ILO Fundamental Principles and Rights at Work, AND the risk assessment for the relevant indicators of Category 1 confirms enforcement of applicable legislation ('low risk'); AND
- (12) Other available evidence do not challenge a 'low risk' designation.

Indicator 2.2 Risk Designation: Low Risk for the entire assessment area, particularly in the forest sector

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INDICATOR 2.3: INDIGENOUS & TRADITIONAL PEOPLES' RIGHTS

"The rights of indigenous and traditional peoples are upheld."

Relevant Indicators from the Category 1 (Legality) Centralized National Risk Assessment:

- *Indicator 1.13 (Customary Rights):* Low Risk at the national level
- *Indicator 1.15 (Indigenous Peoples Rights):* Low Risk at the national level

Context and Considerations (from FSC-PRO-60-002a)

- Are there indigenous peoples, and/or traditional peoples present in the area under assessment?
- Are the provisions of ILO Convention 169 and United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) enforced in the area concerned? (refer to Category 1)
- Is there evidence of violations of legal and customary rights of indigenous or traditional peoples?
- Are there any 'conflicts of substantial magnitude' pertaining to the rights of indigenous and/or traditional peoples?
- Are there any recognized laws and/or regulations and/or processes in place to resolve conflicts of substantial magnitude pertaining to indigenous or traditional peoples' rights?
- What evidence can demonstrate the enforcement of the laws and regulations identified above? (refer to Category 1)
- Is the conflict resolution broadly accepted by affected stakeholders as being fair and equitable?

For the purpose of Indicator 2.3, a 'conflict of substantial magnitude' is a conflict which involves one or more of the following:

- a) Gross violation of the legal or customary rights of indigenous or traditional peoples;
- b) Significant negative impact that is irreversible or that cannot be mitigated;
- c) A significant number of instances of physical violence against indigenous or traditional peoples;
- d) A significant number of instances of destruction of property;
- e) Presence of military bodies;
- f) Systematic acts of intimidation against indigenous or traditional peoples.

Guidance:

In the identification of conflicts of substantial magnitude one must also be aware of possible parallel activities of other sectors than the forest sector that also impact the rights of indigenous/traditional peoples and that there can be a cumulative impact. This cumulative impact can lead to a 'gross violation of indigenous peoples' rights' or 'irreversible consequences' but the extent of the contribution of forest management operations needs to be assessed.

The substance and magnitude of conflicts shall be determined through NRA development process according to national/regional conditions. NRA shall provide definition of such conflicts.

Assessment:

Historical Context

The federal government entered into more than 400 treaties with various Native American Nations from 1778 to 1871. After 1871, the United States instead used formal agreements between Native American Nations and the federal government as a replacement for treaties. Even though Congress ended treaty-making with tribes in 1871, the pre-existing treaties are still in effect and contain promises which bind the United States today. In total, almost 600 documents were signed between 1778 and 1911. In these treaties and other constructive arrangements between Native American Nations and the United States some lands were reserved for them and for their use. These are called reservations. Some provisions were included in the treaties for the Native American Nations to continue to use the land they ceded to the government by concluding the treaty. These usufructuary rights¹ outside the reservations were the rights of the Native Americans to hunt, fish, and gather forest products off the land or to get access to sacred sites. Because they retained these rights in their treaties, these are referred to as reserved rights. Many of these treaties and other arrangements have been violated by the United States and the current reservations do not always reflect the areas agreed upon as reservations in the treaties and other arrangements. [Sources: 122,123,124,125,126]

There is significant evidence of historical violations of legal and customary rights of Indigenous Peoples in the US, however, Indicator 2.3 requires an assessment of the current situation.

Current/Recent Context

According to the United States Census Bureau, approximately 5.2 million people in the U.S., or 1.7% of the total population, identified as Native American or Alaska Native alone or in combination with another ethnic identity in 2010. In addition, there are roughly half a million persons that identify entirely or partly as Native Hawaiians. [Source: 120] There are 567 federally recognized tribal entities in the United States, and many of these have federally recognized national homelands or 'reserves' [Source: 121]. Between 200-300 additional groups identify as historical Indigenous nations but have not been federally recognized, although some are in the recognition process and some have achieved recognition at the state level [Source: 122]. Indigenous peoples are present in all regions of the US.

There are a number of pieces of legislation at the core of federal policy protecting Native American rights, including: the Indian Self-Determination and Education Assistance Act of 1975, by which tribes are able to assume the planning and administration of federal

¹ Usufructuary right: the right of enjoying a thing, the property of which is vested in another, and to draw from the same all the profit, utility and advantage which it may produce, provided it be without altering the substance of the thing.

programs that are devised for their benefit; the American Indian Religious Freedom Act of 1978, which directs federal officials to consult with tribes about actions that may affect religious practices; and the Native American Graves Protection and Repatriation Act of 1990, which directs federal agencies and museums to return indigenous remains and sacred objects to appropriate indigenous groups. A combination of other laws, policies, executive orders and programs fill out the suite of protections by providing additional protections for indigenous religion and culture, and addressing Indian economic and natural resource development, education and civil rights. [Source: 127,138] The low risk designations for relevant indicators in the Category 1 assessment indicate that these laws are enforced.

The Federal Government has several agencies dedicated specifically to indigenous affairs, the principal one being the Bureau of Indian Affairs (BIA) within the Department of the Interior. Under federal law, the United States holds in trust the underlying title to the Indian lands within reservations and other lands set aside by statute or treaty for the tribes. The Department is responsible for overseeing some 55 million surface acres and the subsurface mineral resources in some 57 million acres. [Source: 127] These lands have traditionally been managed by the BIA, but in recent years (see below), more tribes are taking on land management responsibilities themselves. There are many other indigenous-specific agencies and programs throughout the Government. The Government has recently made an increased effort to appoint indigenous individuals to high-level government positions dealing with indigenous affairs, including the position of Assistant Secretary for Indian Affairs, which heads the BIA and the Senior Policy Advisor for Native American Affairs, which was created to advise the President on issues related to indigenous peoples. [Source: 127]

However, sources still express concerns regarding the rights of Native Americans in the US, including: violence against Native American women [Sources: 127,128,129]; access to, control over, and protections of places of cultural and religious significance [Sources: 122, 127, 130, 131, 132, 133, 134, 135, 138]; ability to achieve federal recognition [Sources: 127,135]; management of and control over trust lands and other lands and waters for which rights are held or that affect tribal well-being [Sources: 122,127,129,133,134,136,137,140]; use of consultation and Free, Prior and Informed Consent (FPIC) [Sources: 122,130,131,138,139]; doctrine used by the US Federal court system [Sources: 127, 136, 137]; and lack of ratification of and conformance with the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), and the ILO Convention 169 [Sources: 122,127,132].

Recent Federal Government Efforts

To address concerns such as those identified above, the US Federal government has made a number of recent changes to improve the effectiveness of the legislation and policy that address Native American rights. These efforts build on others in the last few decades that have been overall recognized as advancing indigenous self-determination and development with respect for cultural identity, and as being generally in line with the aspirations expressed by indigenous peoples [Source: 127].

Perhaps most importantly, while the U.S. did not vote for UNDRIP when it was originally adopted in 2007, at the request of Tribes, individual Native Americans and others in the country, it reviewed its position, including extensive government-to-government consultation with tribal leaders, and in 2010 decided to support the Declaration [Source: 73]. At the same time that the US government announced its endorsement of the Declaration, it also provided a statement of how it would support UNDRIP, and recognized, as did many tribal leaders, that this would require the US government to continue to work with tribal governments [Sources: 71,72,73]. The Declaration ensures that indigenous peoples' rights to cultural integrity, education, health, and political participation are protected. It provides for the

recognition of indigenous peoples' rights to their lands and natural resources, and the observation of their treaty rights. It also requires countries to consult with indigenous peoples with the goal of obtaining their consent on matters with concern them (i.e., free, prior and informed consent or FPIC). Basically, it recognizes indigenous peoples' right to self-determination. [Source: 74]

[NOTE: ILO Convention 169, which the United States has not ratified, similarly recognizes indigenous peoples' right to self-determination, while setting standards for national governments regarding indigenous peoples' economic, cultural and political rights, including maintenance of their own identifies, languages and religions, control over their own institutions and ways of life and economic development, and participation in decision-making on activities that may impact them. [Source: 75]]

Recent changes in legislation and policy that are shaping the US Government's relations with tribes and helping to ensure tribes' self-determination, as required by UNDRIP and ILO Convention 169 include the following (and tribes are actively exercising that self-determination as a result [Source: 83]):

- Establishment of the White House Council on Native American Affairs to work on economic development, healthcare, tribal justice systems, education and the management of land and natural resources – chaired by the Secretary of the Interior, this group is tasked with making policy recommendations to the President, coordinating with Native organizations, coordinating tribal consultations and assisting in organizing the yearly White House Tribal Nations Conference.
- Federal Recognition: The US government continues to recognize additional tribes (there are now 567 recognized tribes and many others in the review process). A new final rule was published in 2015 to amend the regulatory process in order to speed it up and make it more transparent. [Sources: 76,77]
- Restoration of Trust Lands: Self-governance and tribal sovereignty are linked with the right to manage tribal lands. The Obama administration placed over 500,000 acres of land into trust for tribal nations, reversing a historic trend of loss of tribal homelands. [Source: 80]
- Economic Development: In 2016, the Indian Trust Asset Management Reform Act was signed into law (with great support from tribes), providing tribes with greater provisions to manage their own trust asset (including the above trust lands) and therefore their own economic opportunities, such as surface leasing, forest management and appraisals without approval of the Secretary of the Interior. [Sources: 78,79,83] And the 2010 Claims Resolution Act settled four tribal water rights issues, settled litigation that addressed mismanagement of trust assets, settled a lawsuit addressing alleged discrimination against Indian farmers in federal agricultural programs, and created a fund to address historic accounting and trust management issues. [Source: 73,81,82]
- Tribal Court: The 2013 reauthorization of the Violence Against Women Act included new provisions that gave tribes the authority to prosecute in tribal courts individuals who commit acts of domestic violence on tribal lands, regardless of whether they are Indian or not [Source: 82,83]. And even before these additional authorities were added, The Tribal Law and Order Act of 2010 gave tribes greater authority to prosecute crimes [Source: 73,83].
- U.S. Courts: After many years of unsuccessful filing and outcomes for cases heard at the US Supreme Court, during the 2015 term, 26 Indian law case petitions were filed, 5 were heard by the Court and there were four wins and one loss [Source: 86]. And it appears that this increase in activity at the Supreme Court level continued for 2016 and into 2017 [Source: 117].

- Government-to-Government Consultation/FPIC: The President issued an Executive Memorandum in late 2009 that directed all federal agencies to develop a plan within 90 days to consult and coordinate with tribal governments, thereby enforcing President Clinton's Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments [Source: 90]. This Memorandum resulted in new policies regarding consultation and coordination with Indian Tribes [Source: 90,91,92,115,116].
- Health: The Indian Health Care Improvement Act (reauthorized in 2010) modernizes tribal health care networks and helps to ensure every Native American receives the health care promised to them. [Sources: 83,84]
- Education: The 2015 reauthorization of the Elementary and Secondary Education Act (called the Every Student Succeeds Act) includes several new indigenous peoples-specific provisions. [Sources: 73,85]
- Religion: In 2012, the Departments of Defense, the Interior, Agriculture, and Energy and the Advisory Council on Historic Preservation entered into a Memorandum of Understanding (MOU) regarding 'Interagency Coordination and Collaboration for the Protection of Indian Sacred Sites.' The action plan for the MOU requires that the provisions of the MOU be implemented in consultation with Indian tribes. [Source: 101]

Not only did the US endorse UNDRIP, but in 2016, as a member of the Organization of American States, the US adopted the American Declaration on the Rights of Indigenous Peoples (ADRIP). The ADRIP was finalized after almost 30 years of work with the indigenous peoples and 35 independent states of the western hemisphere. It was developed with the guiding principle that no standard would be adopted that was lower than the standards contained in the UNDRIP. Some go beyond UNDRIP, including treaties, the rights of children, and the rights of peoples in voluntary isolation. [Sources: 102,103,104]

In his 2017 State of Indian Nations speech, National Congress of American Indians President, and Swinomish Indian Tribal Community member, Brian Cladoosby recognized that government-to-government relations with the US government were the best they had been since the formation of the US government. He also recognized many of the programs and policies detailed above that were being developed together by the US and tribal government and were being successfully implemented by the tribes. [Source: 83]

Resolution of Tribal Disputes

While there are examples of tribal disputes that are either ongoing or have not had successful resolution [Sources: 127,129,133,134,135,136, 137,138], these examples do not provide conclusive evidence that the system is broken and that that laws and regulations and/or other legally established processes do not exist that serve to resolve conflicts, because there are also an increasing number of more recent successes in resolving disputes through the court system, or through other means [Sources: 81,93,94,95,96,97,98,99,100,109,127,129,133,141,142,143].

Further, the US government is allowing its agencies to use and seeing an increase in use of alternative dispute resolution programs [Source: 87], and is even providing expertise specifically for tribal concerns through the Native Dispute Resolution Network (a network of American Indian, Alaska Native, Native Hawaiian and non-Native Environmental Conflict Resolution professionals) [Source: 88]. Conflict resolution through negotiation is closer to traditional Native approaches than mediation and much closer than use of the court system [Source: 89].

The point is that there are established processes that serve to resolve treaty and other rights disputes.

Forest Management By and For Tribes

Ultimately, Indicator 2.3 is concerned with the current and near future situation related to indigenous peoples' rights specifically within the forest sector.

A large part of self-determination is the right to manage your own assets and resources, including forest management and tribes in the assessment area are using forest management to further self-determination and tribal rights. [Sources: 107,118,119]

Indigenous peoples do not see a forest just as a source of economic resource, but as an integral element of their cultural being, and part of a Tribe's self-determination is making or being an integral part of making the decisions on how the forest is managed so that these values are respected [Source: 105]. Many tribes in the assessment area are engaging in sustainable forestry management practices, which are seen as models for forest management elsewhere, as is evidenced by the high-level of active participation in the Inter-Tribal Timber Council which was established in 1976 [Sources: 106,107,108,119]. In fact, 302 Tribes have forest lands and are engaged in forest management, and there has been an increase in Tribal Natural Resources Departments, those departments' active participation in forest management, and foresters on tribal staff, including a 84% increase in tribes taking over forest management from the Bureau of Indian Affairs (who managed the forests in trust for the tribes), and a 60% increase in tribal staffing from 1991 to 2011 [Source: 110; Expert: Mike Dockry].

Overall management of tribal lands has transformed from being completely dominated by Bureau of Indian Affairs (BIA) policies, which for forests emphasized timber production, to approaches that incorporate tribal visions and values for the land [Source: 110, 119, Expert: Mike Dockry]. The legislation that regulates the management of trust lands was revised in 2012, providing tribes with much greater decision-making power over what happens with those lands [Sources: 78,79,83,119].

Tribes are becoming much more active, not just in management of their own lands, but also the lands around their reservation and trust lands. The Tribal Forest Protection Act (2004) gives Tribes the ability to propose and implement management projects on US Forest Service and US Bureau of Land Management lands around their trust lands in order to protect their rights, lands and resources by reducing threats on these other lands [Source: 111]. Tribes are active partners in the Anchor Forest program which is an effort to provide forest land stewardship across ownership boundaries and among disparate interests [Source 112]. Tribes are active partners in most of the 22 Landscape Conservation Cooperatives, particularly on initiatives related to climate change resilience [Source: 113,114]. Additionally, recent changes to the US Forest Service consultation procedures and requirements have improved tribal participation in decision-making on National Forest lands – there are extensive requirements for government-to-government consultation prior to management of forests where tribes have rights and/or customary use [Sources: 115,116,119].

Consultation with Tribes and Experts

FSC US staff consulted with two FSC-certified tribes, two forest managers with extensive experience working with Tribes, and a representative of an affiliation of tribes. In these consultations, FSC US staff heard concern expressed by the representative of the affiliation of tribes regarding localized forest management activities on ancestral lands to which the tribe in question does not have legal rights. However, the certified tribes and the forest

managers supported a low risk designation, recognizing that there may be isolated and infrequent events, but that there are not widespread violations of tribal rights within the forest sector. (Experts: Marshall Pecore, Marc Gauthier, Jeff Lindsey, Paul Koll, Karen Brenner)

Low Risk Thresholds that Apply:

(17) The presence of indigenous and/or traditional peoples is confirmed or likely within the area under assessment. The applicable legislation for the area under assessment covers the basic principles of ILO governing the identification and rights of indigenous and traditional peoples and UNDRIP, AND risk assessment for relevant indicators of Category 1 confirms enforcement of applicable legislation ('low risk'); AND

(19) There is no evidence of conflict(s) of substantial magnitude pertaining to rights of indigenous and/or traditional peoples [**NOTE:** within the forest sector]; AND

(21) Other available evidence do not challenge a 'low risk' designation.

Indicator 2.3 Risk Designation: Low Risk for the entire assessment area, particularly in the forest sector

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Experts Consulted:

- Mike Dockry, U.S. Forest Service
- Marshall Pecore, Menominee Tribal Enterprises
- Marc Gauthier, Upper Columbia United Tribes
- Jeff Lindsey, Hoopa Valley Tribal Council
- Paul Koll, Forest Manager

Karen Brenner, Consulting Forester

Annex E Detailed Descriptions of HCVs and Risk Designations

This annex is intended to provide the provide the Category 3 assessment in a more accessible format than the required National Risk Assessment template in the main document. Additionally, it includes supplemental details, context and guidance that are not in the main document which are intended to help readers better understand the rationale behind the identification of HCVs and risk designation decisions for Category 3 indicators. For any category with an associated annex, the content found in the main body of the risk assessment, not the annex, is definitive.

Category 3 – High Conservation Values

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NOTES ON THE GENERAL ASSESSMENT PROCESS:

Identification of HCV was based primarily on the on the definitions in the FSC-US Forest Management Standard and additional guidance in the ‘FSC-US Draft HCVF Assessment Framework,’ with significant consideration of definitions in the NRA Framework (FSC-PRO-60-002a) and guidance in the ‘Common Guidance for the Identification of HCV.’ While the FSC-US assessment framework was never formally finalized, it has been in regular use since 2010. Using the FSC-US standard definitions and FSC-US assessment framework results in some differences from other global frameworks – most significantly, Roadless Areas are included in HCV 3 (instead of HCV 2), because in the US, they are quite rare and other than those protected within Federal Wilderness Areas (or other protective designations), they are generally quite small (not landscape level forests).

When possible, data sets that were consistent for the entire assessment area were used, but when these were not available, regional data, literature reviews and/or consultation with experts were used.

It is also worth noting that while the WWF Global 200 Ecoregions in the US were not used as a primary source of information for identifying HCV, when the forest types associated with the HCV 1 Critical Biodiversity Areas, HCV 3 Old Growth and HCV 3 Priority Forest Types

are considered together, they align well with the forested WWF Global 200 Ecoregions in the U.S.

NOTE: Static PDF maps of specified risk designations are available on the FSC US web site and a spatial data layer is available upon request.

NOTES ON BIODIVERSITY AND PROTECTIONS:

During the last ice age, glaciers covered the northern third of the United States. These glaciers carved out the Great Lakes basins, shaped the topography and left behind glacial deposits that formed the Great Lakes and Northeastern regions' soils. The varying soils and topography drive the diversity of species composition on forests across this part of the US.

The historical geologic activity in the southeast United States created the Appalachian Mountains. Large portions of the region were, at times, covered by seawater. This history led to a great diversity in soil types that are able to support many different habitats. The southeast United States is one of the most biodiverse temperate areas in the world. In addition to the geologic history, the temperate climate, high annual rainfall, and latitudinal range also contribute to the high diversity of ecosystems. [204]

The western United States is geologically young, with mountain ranges created by tectonic activity. The glaciers that once covered the northern part of the region deposited sediment and helped to carve out some of the mountains. [205] Climate and topography heavily influence the diversity of ecosystems.

Habitat destruction is the leading cause of biodiversity loss in the United States, followed by non-native invasive species [206]. Other threats to biodiversity that are frequently mentioned are similar to those seen globally: climate change, pollution, and over-exploitation.

As detailed in Category 1, the US has a broad and comprehensive legal structure that addresses the protection of socially and ecologically important sites, administered at both the federal and state level. The risks of non-compliance with these laws on public lands is generally low. The risk on private lands is also low, but attention should be given to areas known to be important to listed species.

Protective Designations

FSC US used the Protected Areas Database of the United States to assess whether or not land was under protection for Category 3 HCVs. This database is the official inventory of protected areas in the United States, published by the U.S. Geological Survey Gap Analysis Program (GAP). The database compiles public parks, designated areas, conservation easements, and Marine Protected Areas, and is continuously updated. The database includes conservation rankings for both GAP Status Codes 1-4 and International Union for the Conservation of Nature (IUCN) categories. [181] As is common practice, the following assessment considers an area as permanently protected if it has a GAP Status of 1 or 2 [185]:

- *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. Example: Federal Wilderness Area

- *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. Examples: National Park, National Wildlife Refuge, National Natural Landmark

PAD-US data is used to inform the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) World Database on Protected Areas. (WDPA) [181] The WDPA is used to report on progress towards the Aichi Biodiversity Targets, by the United Nations to track progress towards Sustainable Development Goals, and for other international assessments and reports. [182] Other non-governmental organizations that partner to help develop PAD-US include The Nature Conservancy, The Trust for Public Lands, NatureServe, and the Commission for Environmental Cooperation. [183] These uses of the data indicate that this is a highly-trusted source of information.

While there haven't been any studies that looked specifically at the effectiveness of protective designations in the US, there are studies that look at the network of protected lands in the US (as classified by the PAD-US) and whether they represent ecological systems accurately. The use of the PAD-US dataset in this way indicates that it is recognized and respected as a valid source for information about areas that are effectively protected. One of these studies even explicitly recognizes this by stating, "the protected areas network within the continental US is often viewed as one of our best conservation tools for securing vegetation communities and the species they support into the future." [184]

Additionally, most of the GAP Status 1 and 2 designations are written into federal law [185] and the US is typically rated well or very well on global indices and indicators for legality, governance and law enforcement (see Category 1 and Category 2 assessments).

HCV 1 – Species Diversity

FSC considers materials that come from places where High Conservation Values are threatened by forest management activities to be unacceptable materials. Therefore, the NRA assesses the risk of sourcing from these kinds of areas.

HCV 1 Definitions:

FSC-PRO-60-002a (NRA Framework): "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 Forest Management Standard: "HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)." HCV 1 includes rare, threatened or endangered species.

Common Guidance for the Identification of HCV² - HCV 1:

"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,

² 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

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.
- 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).”

Given the above definitions and guidance, the following assessment of HCV 1 focuses on concentrations of biodiversity within Critical Biodiversity Areas and on individual species, with an overall emphasis on rarity and endemism.

For the purposes of this risk assessment, the following thought process is applied:

1. *Are HCV 1 present? – If no, the area is designated ‘Low Risk.’ If yes, go to #2.*
2. *Is the HCV 1 threatened by forest management activities? – If no, the area is designated ‘Low Risk.’ If yes, the area is designated ‘Specified Risk.’*

Critical Biodiversity Areas (CBA)

Data Used for HCV Identification:

This portion of the assessment was informed by a dataset of rarity-weighted richness for critically imperiled and imperiled species in the United States, a species richness index originally published by NatureServe and The Nature Conservancy (TNC) in 2000 that identifies areas with high concentrations of rare species³. The study identifies concentrations of biodiversity, based on occurrence data from NatureServe, of almost 2,800 rare species in the US, including plants, mollusks, arthropods, fish, reptiles, amphibians, birds, and mammals. The index preferences species with limited ranges by applying an additional weighting to species that is inversely proportionate to the size of the species' range (rarity-weighted richness index). The spatial unit of analysis was a grid of hexagons, each about 160,000 acres in size. Rarer species (endemic species with very limited ranges) 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 (i.e., it counts as 1.0 species), if it occurs in two hexagons it counts as half (i.e., 0.5 species) in each of those hexagons, if it occurs in three hexagons it counts as 1/3, etc. These weighted values are then summed for each hexagon to get the rarity-weighted richness index for that hexagon. This dataset was updated by NatureServe in 2013, and the revised data were used for identification of concentrations of biodiversity, termed Critical Biodiversity Areas for these purposes of this risk assessment. A kernel density analysis was completed on the dataset, using a search radius of 100 km. A threshold was selected similar to that used by the original FSC US NRA Working Group (NRA WG) for their analysis of the original dataset. This threshold was selected to ensure known areas of high biodiversity were included. The resulting 16 areas from the more recent analysis may be viewed on a map available from the FSC US National Risk Assessment web page⁴ and are individually assessed below for threats from forest management activities.

This study aligns well with the HCV 1 definition of concentrations of biological diversity, as it identifies places with an increased conservation significance. It also aligns in with the focus on endemic species, and rare, threatened or endangered (RTE) species.

One limitation of the NatureServe dataset is that it is driven by survey effort. However, overall NatureServe maintains the most standardized, most scientifically rigorous dataset that we have available for the entire area under assessment. While unlikely, it is possible that a concentration of biodiversity has been missed due to lack of survey, but as revisions of the NRA occur, updates to this dataset will be incorporated. At the same time, the inverse is likely not true; it is unlikely that an area that is not truly a concentration of biodiversity has been included just because it is well surveyed – the methodology which limits the analysis to rare species and applies the weighting of range-limited species, will help to ensure the index is one of biodiversity and not just species richness. As a result, the index for a particular place will not be bloated by a large number of common species documented through extensive survey effort.

It is also worth noting that this index is influenced by non-forest species. However, in areas that are predominately forested or forest matrix (and where forest management activities are more likely occurring) it should be representative of biodiversity in those areas and therefore help to focus this assessment on areas of greatest overall significance for the NRA. The

³ Chaplin, S. J., R. A. Gerrard, H. M. Watson, L. L. Master, and S. R. Flack. 2000. The geography of imperilment: Targeting conservation towards critical biodiversity areas. Pages 159-199 in B. A. Stein, L. S. Kutner, and J. S. Adams, eds. *Precious Heritage: The Status of Biodiversity in the United States*. Oxford University Press, New York. 399pp.

[<http://www.natureserve.org/biodiversity-science/publications/precious-heritage-status-biodiversity-united-states>]

⁴ <https://us.fsc.org/en-us/certification/controlled-wood/fsc-us-controlled-wood-national-risk-assessment-us-nra>

dataset used for this assessment includes only the index numbers for each hexagon cell, so it is not possible to weight by survey effort or to remove species that are not forest-dependent.

Other datasets were investigated for this assessment, including U.S. Fish & Wildlife Service's designated Critical Habitat for listed species⁵, Aquatic Biodiversity Hot Spots as defined in NatureServe's Rivers of Life report⁶, and priority areas and opportunity areas from State Wildlife Action Plans. However, these other datasets provide information at different scales and for different spatial areas and overall are not as closely aligned with the definition of HCV 1 as the dataset selected for use. The NRA WG that the Rarity-Weighted Richness dataset from NatureServe provided the most consistent data across the entire assessment area at a scale that was deemed most appropriate for the NRA's purpose.

Summary of Risk Designations for identified HCV 1 Critical Biodiversity Areas:

| Critical Biodiversity Area | FSC US Region⁷ | Risk Designation |
|-----------------------------------|---|--|
| Southern California CBA | Pacific Coast | Low Risk |
| Central California CBA | Pacific Coast | Specified Risk for portions of CBA within the WWF Sierra Nevada ecoregion that are not permanently protected |
| Klamath-Siskiyou CBA | Pacific Coast | Specified Risk |
| Chihuahuan Desert CBA | Southwest | Low Risk |
| Southwest Non-Forested CBAs | Rocky Mountain/ Southwest/Non-Forested | Low Risk |
| Central Texas CBA | Non-Forested (Central U.S.) | Low Risk |
| Blue River CBA | Great Lakes | Low Risk |
| Central Appalachians CBA | Appalachian | Specified Risk |
| Southern Appalachians CBA | Appalachian/Southeast | Specified Risk |
| Cape Fear Arch CBA | Southeast | Specified Risk |
| Florida Panhandle CBA | Southeast | Specified Risk |
| Central Florida CBA | Southeast | Specified Risk |
| Southern Florida CBA | Southeast | Low Risk |

Southern California CBA

FSC Region: Pacific Coast

Description: A portion of this CBA includes forested lands which are focused on the four National Forests (Los Padres, San Bernardino, Cleveland & Angeles) that border the greater Los Angeles metropolitan area. However, most of the CBA is non-forested.

Indication of Risk: Most of the CBA is non-forested [Source: 9] and therefore not likely to be threatened by forest management activities. While logging is one of a number of historic practices that have led to deterioration of the national forests in this CBA, the current threats

⁵ <http://criticalhabitat.fws.gov/crithab/>

⁶ <http://www.natureserve.org/sites/default/files/publications/files/riversoflife.pdf>

⁷ See Annex B for a map of FSC US Regions

are primarily driven by intensive development and recreational pressures due to their proximity to Los Angeles [Source: 7]. The four major threats are fire and fuels (due to lack of forest management and fire suppression), invasive species, loss of open space to development, and unmanaged recreation [Sources: 7,8].

Risk Designation: Low Risk

Sources of Information:

7. Center for Biological Diversity. Introduction to the Four Southern California National Forests: Los Padres, Angeles, San Bernardino, Cleveland. Retrieved from http://www.biologicaldiversity.org/programs/public_lands/forests/southern_california_forests/pdfs/Intro-4-S-CA-National-Forests.pdf

8. U.S. Forest Service. Four Threats. 2006. Retrieved from <https://www.fs.fed.us/projects/four-threats/>

9. U.S. Geological Survey. GAP Land Cover Data Portal. Retrieved from <http://gapanalysis.usgs.gov/gaplandcover/>

Central California CBA

FSC Region: Pacific Coast, Rocky Mountain

Description: The California Floristic Province is recognized by many international conservation organizations as a globally recognized center of biodiversity. This CBA includes two general ecological regions that support high levels of biodiversity – the higher elevation Sierra Nevada mountains and the lower elevation California coastal region. For the purposes of this assessment, the focus is on the Sierra Nevada portion, because the concentrations of biodiversity in the coastal area are primarily associated with non-forested coastal prairies.

The Sierra Nevada hosts a wide variety of biodiversity including hundreds of vertebrates, rare species, and endemic plants. Approximately 400 terrestrial vertebrate species have been documented the Sierra Nevada and 13 are endemic to the range. Species include the white-headed woodpecker (*Picoides albolarvatus*), Sierra green sulfur butterfly (*Colias behrii*), Behr's colias butterfly (*Colias behrii*), Yosemite toad (*Bufo canorus*), Mount Lyell salamander (*Hydromantes platycephalus*), the threatened limestone salamander (*H. brunus*), Clark's nutcracker (*Nucifraga columbiana*), mountain lion (*Felis concolor*), sugar pine (*Pinus lambertiana*), and Ponderosa pine (*P. ponderosa*).

Biodiversity in the forested areas of this part of the California Floristic Province is dependent on a diversity of stand types and ages, including species diversity of trees, forest openings, and standing and downed woody structure. Forest management has the potential to influence this within stand and between stand diversity. The priority habitats that primarily support the concentration of biodiversity in this area are Mixed Conifer Stands and Montane Meadows.

The Sierran mixed conifer habitat occurs as a vegetation band ranging 770 to 1230 m (2500 to 4000 ft) in the north to 1230 to 3076 m (4000 to 10,000 ft) in the southern Sierra Nevada. It supports a large number of rare species, including spotted owl, fisher, pine marten, bald eagle and peregrine falcon.

Montane meadows are grassland habitats, both wet and dry, that occur in the higher elevations of the Sierra Nevada. They represent the most botanically diverse ecosystems in the Sierra Nevada and are also important for wildlife species, especially birds.

Indication of Risk:

- Mixed Conifer Stands – Threats include forest simplification due to forest management activities (affecting both within stand and between stand diversity), logging, grazing, and fire suppression. [Sources: 10,11]
- Montane Meadows – Habitat loss to vineyards, orchards & development, fire suppression, invasive species, grazing, and road construction (resulting in channel incision) for forest management and other activities are all identified as threats [Sources: 10,15,16]
- While a portion of the Sierra Nevada is protected [Source: 18], the priority habitats also occur in portions of the CBA that are not protected [Sources: 12,15].
- The portion of the CBA in the Rocky Mountain region is almost completely non-forested [Source: 91]

Risk Designation: Specified Risk for the portion of the CBA that is in the WWF Sierra Nevada ecoregion and that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in the PAD-US⁸ dataset and USFS Inventoried Roadless Areas⁹). Low Risk for the remainder of the CBA.

Sources of Information:

10. Mooney, Harold and Erika Zavaleta, eds. 2016. Ecosystems of California: Threats & Responses. CA: The Regents of the University of California. 72 p.
11. World Wildlife Fund. Sierra Nevada Forests. Retrieved from <http://www.worldwildlife.org/ecoregions/na0527>
12. North, Malcolm, ed. 2012. Managing Sierra Nevada Forests. Gen. Tech. Rep. PSW-GTR-237. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 184 p.
13. North, Malcolm; Peter Stine, Kevin O'Hara, William Zielinski, and Scott Stephens. 2009. An Ecosystem Management Strategy for Sierra Mixed-Conifer Forests. Gen. Tech. Rep. PSW-GTR-220. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. 49 p.
14. Sierra Forest Legacy. Montane Meadows. Retrieved from https://www.sierraforestlegacy.org/FC_FireForestEcology/TH_MontaneMeadows.php
15. Ratliff, R.D. 1985. Meadows in the Sierra Nevada of California: State of Knowledge Gen. Tech. Rep. PSW-GTR-84. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, U.S. Forest Service, U.S. Department of Agriculture; 52 p.
16. Viers, Joshua H., et al. 2013. Montane Meadows in the Sierra Nevada: Changing Hydroclimatic Conditions and Concepts for Vulnerability Assessment. Center for Watershed Sciences, University of California Davis. 63 p.
17. California Department of Fish and Game. California Wildlife Habitat Relationships System: Sierran Mixed Conifer. 2005. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67311&inline>
18. US Geological Survey. US-Protected Areas Database. Retrieved from <http://gapanalysis.usgs.gov/padus/>
91. Intact Forest Landscapes. Intact Forest Landscapes Data Download, The IFL Mapping Team. Retrieved from <http://www.intactforests.org/data.ifl.html>

⁸ <https://gapanalysis.usgs.gov/padus/data/download/>

⁹ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

Klamath-Siskiyou CBA

FSC Region: Pacific Coast, specifically within the Klamath Region in northern California and southwestern Oregon (this CBA consists of two non-adjacent polygons, but both occur within the WWF Klamath-Siskiyou ecoregion)

Description: 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 that provide habitat for a very large number of terrestrial and aquatic species, including many invertebrate species. Forest-based biodiversity in the Klamath-Siskiyou is largely sustained in diverse mixed conifer stands adapted to low-mid fire severity and frequency.

Indication of Risk: Structural changes within mixed conifer stands due to altered fire regimes and conversion to monodominant stands through forest management can affect the biodiversity values of these areas. Other threats include fire suppression, habitat loss (due to logging), mining, road building, and grazing [Sources: 19,20,22]

Risk Designation: Specified risk for the entire CBA

Sources of Information:

19. California Department of Fish and Game. California Wildlife Habitat Relationships System: Klamath Mixed Conifer. 2005. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67316>
20. Klamath-Siskiyou Wildlands Center. The Klamath-Siskiyou Ecoregion. Retrieved from <http://kswild.org/>
21. Nature Serve. NatureServe Explorer Database. Retrieved from <http://explorer.natureserve.org/>
22. World Wildlife Fund. Klamath-Siskiyou. Retrieved from <https://www.worldwildlife.org/ecoregions/na0516>

Chihuahuan Desert CBA

FSC Region: Southwest

Description: This CBA extends from western Texas into New Mexico and is mostly non-forested. However, a small forested area occurs mostly within the Lincoln National Forest of New Mexico and is associated with the Sacramento Mountains area.

The Sacramento Mountains area identified as a conservation priority due to the high concentration of biodiversity and forests provide habitat to a number of rare species, including the Sacramento Mountain Salamander and Mexican Spotted Owl. The driver of biodiversity appears to be the diversity of habitats resulting from this area being a transition zone that includes both more northern and more southern species, and large elevation change that results in habitats from desert to sub-alpine.

Lincoln National Forest has a very diverse landscape, with vegetation types that range from rare cacti in the lower elevations to Englemann spruce higher up.

Indication of Risk: Historically, threats included timber harvest, but evidence indicates that threat is lower and conservation efforts are now focused on restoration of the forests. The more significant threats are currently from stand-replacing fires – particularly for forest-dependent species like the Mexican spotted owl – and climate change. [Sources: 207,208,211]

Risk Designation: Low Risk

Sources of Information:

207. New Mexico Department of Game and Fish. State Wildlife Action Plan for New Mexico. 2016. Retrieved from <http://www.wildlife.state.nm.us/download/conservation/swap/New-Mexico-State-Wildlife-Action-Plan-SWAP-Final-2017.pdf>
208. The Nature Conservancy. Ecoregional Conservation Analysis of the Arizona-New Mexico Mountains. 1999. Retrieved from http://azconservation.org/dl/TNCAZ_Ecoregions_Assessment_AZ-NM_Mtns.pdf
209. Ganey, J.L., Apprill, D.L., Rawlinson, T.A., Kyle, S.C., Jonnes, R.S., and Ward Jr., J.P. 2013. Nesting habitat of Mexican spotted owls in the Sacramento Mountains, New Mexico. *Journal of Wildlife Management*. 77:1426–1435
210. U.S. Forest Service. Lincoln National Forest. Retrieved from <https://www.fs.usda.gov/main/lincoln/home>
211. U.S. Fish & Wildlife Service, Southwest Region. Mexican Spotted Owl Recovery Plan, First Revision (*Strix occidentalis lucida*). 2012. Retrieved from https://ecos.fws.gov/docs/recovery_plan/MSO_Recovery_Plan_First_Revision_Dec2012.pdf

Southwestern Non-Forested CBAs

FSC Region: Southwest

Description: There are four CBA that occur in northwest Nevada, southwest Utah, southern Arizona, and central Texas.

Indication of Risk: These CBA are almost entirely non-forested and therefore unlikely to be threatened by forest management activities. [Source: 91]

Risk Designation: Low Risk

Sources of Information:

91. Intact Forest Landscapes. Intact Forest Landscapes Data Download, The IFL Mapping Team. Retrieved from <http://www.intactforests.org/data.ifl.html>

Central Texas CBA

FSC Region: Non-Forested (Central U.S.)

Description: A limited portion of this CBA, which occurs in an area adjacent to and including the greater Austin metropolitan area, is forested. It represents a confluence of a number of biotic regions which result in a highly diverse landscape and therefore high biodiversity. The biotic regions include Rolling Plains, Cross Timbers and Prairies, Blackland Tallgrass Prairies, Post Oak Savannah, the Edwards Plateau, and South Texas Tamaulipan Thorn Scrub.

Indication of Risk: Threats to the area include habitat destruction from development (mostly urban development), introduced species, loss of aquifers and springs (again primarily due to increased development and overuse of water resources), water pollution and agricultural effects. Therefore, between the small amount of forest and the threats being primarily associated with urban and agricultural development, it is unlikely that the concentration of biodiversity within the CBA is being threatened by forest management activities.

Risk Designation: Low Risk

Sources of Information:

28. Environmental Science Institute. Hotspot of Biodiversity: Unique and Endangered Animals of Central Texas, a 'Hot Science – Cool Talks' presentation given at the University of Texas at Austin by Dr. David Hills, Professor of Integrative Biology. 2000. Retrieved from <http://www.esi.utexas.edu/talk/hotspot-biodiversity/>

Blue River CBA

FSC Region: Lake States

Description: The Blue River runs through the heart of the CBA boundary. It is recognized as one of the cleanest rivers in Indiana and is home to a number of rare plant and animal species, including the Eastern Hellbender, several species of darters and freshwater mussels. The steep topography of the area provides many riffles, creating habitat for fish and other aquatic life. [Sources: 212, 213]

Karst systems, made primarily of limestone, are abundant in the CBA. The associated caves and springs have been heavily surveyed and exhibit a high level of species diversity. These karst systems provide habitat for many globally rare cave invertebrates. Surface water and runoff flows directly into karst systems instead of being filtered through the soil and bedrock, leaving them susceptible to degradation. These limestone caves also serve as hibernaculum to extensive populations of Indiana bat. [Sources: 212,214; Expert: Allen Pursell]

Indication of Risk:

- Aquatic Habitats – Available information indicates that threats are related to development and associated pollution and sedimentation from agriculture. [Source: 214] No threats from forest management activities were identified. The information available on threats to the eastern hellbender support this assessment. [Source: 213]
- Karst systems – The threats to these systems include chemical pollution, soil runoff and failing septic systems, recreation, dumping, and development of the land above the systems. No threats from forest management activities were identified. [Sources: 214, 215,216; Expert: Allen Pursell]

Risk Designation: Low Risk

Sources of Information:

212. Hauswald, Cassie. Blue River Project. Retrieved from

<http://www.inindianawater.org/story/the-blue-river-project/>

213. The Nature Conservancy. Indiana Hellbender Salamanders. Retrieved from

https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/place_sweprotect/blue-river-project-office.xml

214. Hoen, Jessica – NRCS Salem IN. South Fork-Blue River Watershed Management Plan. 2017. Retrieved from

https://www.in.gov/idem/nps/files/wmp_blue_river-south_fork_5-180.pdf

215. Indiana Karst Conservancy. IKC Slide Show. Retrieved from <http://ikc.caves.org/slideshow>

216. The Nature Conservancy. Journey with Nature: Karst & Caves. Retrieved from <https://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/karst-caves.xml>

Expert Consulted: Allen Pursell, The Nature Conservancy

Central Appalachians CBA

FSC Region: Appalachian (this CBA is an extension of the Southern Appalachian CBA, but for the purposes of this assessment, they are being separated at the regional boundary)

Description: This CBA corresponds with the higher elevation portions of WWF's 'Appalachian Mixed Mesophytic Forest' area, one of their Global 200 biodiversity areas. The area represents one of two regions left in the world where relicts of ancient mesic forests still exist. The region acted as a refuge for mesic species during drier eras and this in combination with the incredible topographic and soil diversity resulted in very high biodiversity. The broadleaf forests and aquatic habitats drive the region's biodiversity.

The forests are significant in the diversity of different forest types that occur and within them the large number of different tree species that occur, along with incredibly diverse understories and associated wildlife species. Both the Mesophytic Cove Forests and the Spruce-Fir Forests assessed below as HCV 3 occur within this CBA. The geologic history, change in elevation, and diverse topography and climate have resulted in a very large number of microhabitats within the region – each with a unique biodiversity. Additionally, the mountains served as a refuge for northern species during the last ice age, and due to the changes in elevation that reflect changes in the climates at different latitudes, the area can harbor a mix of both traditionally more northern and more southern species within the same broad geographic area. The area is particularly diverse in songbirds, salamanders, land snails, amphibians and herbaceous plants.

The region's freshwater systems are together considered to be the richest temperate freshwater ecosystem in the world – representing the highest richness and endemism in mussels, fish, crayfish and other invertebrates for the entire world. The southern running riverine systems allowed many aquatic species to escape the glaciers of the last ice age and then re-establish afterward.

Indication of Risk:

- **Mixed Mesophytic Forest** – Historically, harvests within these diverse forests have been a significant threat, as few are adapted for large-scale disturbance. Removal of overstory trees, both through clear-cut harvests and high-grading where only the most valuable species were removed, resulted in changes to species composition and forest structure, and therefore the biodiversity adapted to them. Extensive fragmentation of intact forest landscapes has occurred. Over 95% of the Mixed Mesophytic Forest habitat has been converted or degraded, leaving a very small number of examples of old-growth and intact examples of these diverse forest types. Most of these remaining remnants occur within protected areas, or in places inaccessible for forest management. Conservation now focuses on ensuring the protection of these areas, restoration of other examples, and reforming more intact landscape-level forests. Other threats in the region include climate change, air and water pollution from mining, new highways and utility rights-of-way, ORV recreation, and over populations of deer [Source: 34,35,217,218,219,220].
- **Aquatic Habitats** - In addition to threats associated with agriculture, development, and mining, the following threats were associated with forest management: Hydrologic alteration partially due to forestry practices and conversion from hardwood forests to non-native planted pine (which may include ditching as a practice in wetter areas), reduced water quality partially due to loss of near-stream forested habitat and sedimentation associated with forestry practices and lack of BMP implementation, and severe erosion of river banks. Three states that intersect the CBA have implementation rates of forestry Best Management Practices (BMPs) that are below the national average. [Sources: 30,33,35,218,222]

Risk Designation: Specified risk for portions of the CBA that occur within the Appalachian region and that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in

the PAD-US¹⁰ dataset and USFS Inventoried Roadless Areas¹¹). Low risk for the remainder of the CBA.

Sources of Information:

29. Southeast Aquatic Resources Partnership. Conserving Fish Habitat from Rivers to the Sea: The story of the Southeast Aquatic Resources Partnership. 2014. Retrieved from <http://www.southeastaquatics.net/resources/sarps-special-reports/conserving-fish-habitat-from-rivers-to-the-sea-the-story-of-the-southeast-aquatic-resources-partnership-1/view>
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34. World Wildlife Fund. The Global 200 – Appalachian mixed mesophytic forests. Retrieved from <https://www.worldwildlife.org/ecoregions/na0402>
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217. Appalachian Mountains Joint Venture. Ecological Priorities. Retrieved from <http://amjv.org/index.php/conservation/category/eco>
218. Greater Appalachian Conservation Partnership. Introduction to the Appalachian Region. Retrieved from <http://amjv.org/index.php/conservation/category/eco>
219. EcoForesters. Threats to Our Forests. Retrieved from <https://www.ecoforesters.org/forest-threats.html>
220. The Nature Conservancy. Central Appalachian Mountains Conservation Challenges. Retrieved from <https://www.nature.org/ourinitiatives/regions/northamerica/areas/centralappalachians/overview/index.htm>
221. Highlands Biological Station. Biodiversity of the Southern Appalachians. Retrieved from <http://highlandsbiological.org/nature-center/biodiversity-of-the-southern-appalachians/>
222. Cristan, R., Aust, W.M., Colding, M.C., Barrett, S.M., Munsell, J.F., and Schilling, E. 2016. Effectiveness of forestry best management practices in the United States: Literature review. *Forest Ecology and Management* 360: 133-151.

Southern Appalachians CBA

FSC Region: Southeast, specifically portions of Alabama and the very northwestern corner of Georgia (this CBA is an extension of the Central Appalachian CBA, but for the purposes of this assessment, they are being separated at the regional boundary)

Description: Biodiversity values in the southern Appalachians are largely driven by exceptional aquatic biodiversity that includes fish, mussels, snails, crayfish, herpetofauna and plants. Alabama is recognized as having the greatest number of freshwater species of mollusks and fish in the United States, and many of these species have very restricted distributions and specialized habitat requirements that make them highly vulnerable to

¹⁰ <https://gapanalysis.usgs.gov/padus/data/download/>

¹¹ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

extinction. The Cahaba River watershed is the center of the biodiversity hotspot, but the biodiversity area includes other smaller watercourses as well. [Source 224] In addition to lakes, rivers and streams, aquatic habitats driving this concentration of biodiversity include bogs, swamps, ephemeral pools, fens, seeps, swamp forests and wet meadows. Other priority habitats that are associated with the concentration of biodiversity that occurs in this CBA include glades and montane longleaf pine.

Bibb County Glades (i.e. rock outcrops), exposed limestone glades, and sandstone glades in Central Alabama have high density of rare plants. These are open habitats that are dominated by upland herbaceous plant species. There is typically an absence of a tree canopy on glades, resulting in large amounts of sunlight and heat on the surface. Bibb County Glades are listed as a Priority Area for Conservation Action in the 2015 Alabama State Wildlife Action Plan. [Source 224]

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.

Indication of Risk:

- Aquatic Habitats – Alabama’s Wildlife Action plan identifies the following as statewide conservation actions that are needed: minimize nonpoint-source pollution in waterways, including from silvicultural sources; minimize disturbance to riparian zones, including from forestry, and minimize or better manage use of fertilizers, herbicides and pesticides near aquatic habitats (and forest practices were identified as a source for this threat). Implementation of forestry Best Management Practices (BMPs) are specifically mentioned for the first two as tactics for achieving the actions. [Source: 224] Additionally, three of the watershed/river basin plans that overlap this CBA include threats or conservation actions related to sedimentation from forestry or silvicultural activities [Sources: 254,255,257]. The Cahaba plan identifies silviculture activities as the number two priority regarding significant contributions of sediment [Source: 254].
- Glades – Threats include grazing, non-native species, quarrying, root-digging, plant and animal collecting, removal of large rocks for landscaping, urban development, plowing for fire breaks, use as logging decks (resulting in soil/vegetation disturbance and soil erosion), conversion to other land uses, and ORV damage [Sources: 37,39]. No threats from forest management activities were identified. [Source 224, Expert: Chuck Byrd]
- Montane Longleaf Pine – Biodiversity values can be adversely affected by forest management activities via conversion of longleaf to other pine types, and the use management techniques, including herbicide application that have the potential to inhibit native understory communities. [Expert: Troy Ettel] As the bulk of the biodiversity exists in the understory of a longleaf pine system, restoration or maintenance of understory species composition is an essential component of longleaf pine conservation. While herbicides can be an essential tool in restoration of longleaf pine, there is mixed evidence regarding the impact of herbicides on understory vegetation – different chemicals and application methods may have differing affects. [Sources: 225,226] Regional experts [Troy Ettel; Carl Nordman] have confirmed that conversion to other managed forest types continues to be a threat. While these other forest types may provide an acceptable habitat for some species, their establishment is threatening the existing longleaf pine areas. It is possible to harvest in and sustainably manage longleaf pine systems [Source: 227, Expert: Troy Ettel] and therefore timber management by itself is not considered a threat. Other threats include fire-suppression, urban development, forest conversion, non-native species, climate change [Sources: 40,41,42]

Risk Designation: Specified risk for portions of the CBA that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in the PAD-US¹² dataset and USFS Inventoried Roadless Areas¹³). Low risk for the remainder of the CBA.

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Experts Consulted:

- Chuck Byrd, The Nature Conservancy
- Troy Ettel, The Nature Conservancy
- Carl Nordman, NatureServe

Cape Fear Arch CBA

FSC Region: Southeast, specifically in the southeastern-most part of North Carolina

Description: The geologic and hydrologic history of the Cape Fear Arch region have resulted in a diversity of wet and dry habitats. This diversity in addition to the sand and limestone deposits that have resulted in a very high diversity of natural communities and associated plant and animal species. The region is considered to have the greatest biological diversity along the Atlantic Coast north of Florida and has been identified in North Carolina’s Wildlife Action Plan, the Nature Conservancy’s Mid-Atlantic Coastal Plain Ecoregional Plan and One North Carolina Naturally as high priority areas for conservation. Rare species associated with the region include Red-cockaded woodpecker, Wood Stork, Cape Fear shiner, shortnose sturgeon, venus fly-traps, golden sedge, green pitcher plant and rough-leaf loosestrife. In one ecotone within the region 22, endemic and an additional 22 near-endemic plants have been documented. The region also represents an important stopover site for migrating birds.

Important drivers of biodiversity in this region include longleaf pine forests and pocosins (coastal peatlands). Pocosins typically occur within Carolina bays as a mosaic, along with Atlantic white cedar forests and nonriverine swamp forests. Most of the world’s pocosins occur in North Carolina and the Cape Fear Arch region has some of the very best examples of high and low pocosins. Pocosins are identified as a Coastal Plain priority natural community in the North Carolina Wildlife Action Plan.

In the outer Coastal Plain, pocosins occur within nutrient-poor peatlands (organic soils) in shallow depressions on plateaus and are typically continuously saturated with water. They harbor rare native plant diversity like the venus fly trap and rare wildlife species like the red-cockaded woodpecker. Pocosins generally have a pine overstory, often Pond pine. Higher, drier sites generally have a dense evergreen shrub layer, while the wettest sites may only have low shrubs, stunted pines and beds of sphagnum, pitcher plants and cranberry.

Longleaf pine forests once covered much of the Atlantic Coastal Plain, but the extent and condition of the system has been severely depleted due to habitat fragmentation, unsustainable harvest, conversion to other land uses and vegetative types, invasive species, and exclusion of natural fire regimes. Upland, Flatwood and Savanna types of longleaf pine systems occur in the Cape Fear vicinity. The CBA includes a portion of the focal areas for the Cape Fear Arch Longleaf Initiative, a successful private-public conservation partnership.

Indication of Risk:

- Pocosins – When the canopy has been completely removed through timber harvest, pocosins often do not regenerate. An associated threat from forest management is the conversion of native pine to planted pine and resulting loss of biodiversity, particularly if associated with changes in hydrology due to ditching [Source: 39,45,46,47]. While these other forest types may provide an acceptable habitat for some species, their establishment is threatening the existing pocosins. Other threats include hydraulic alteration, conversion to agriculture, road construction, and sand quarrying, habitat fragmentation, introduction of non-native species, climate change and fire suppression [Sources: 45,46].
- Longleaf Pine - Biodiversity values can be adversely affected by forest management activities via conversion of longleaf to other pine types, and the use management techniques, including herbicide application that have the potential to inhibit native understory communities [Expert: Troy Ettel]. As the bulk of the biodiversity exists in the understory of a longleaf pine system, restoration or maintenance of understory species composition is an essential component of longleaf pine conservation. While herbicides can be an essential tool in restoration of longleaf pine, there is mixed evidence regarding the impact of herbicides on understory vegetation – different chemicals and application methods may have differing affects. [Sources: 225,226] Regional experts [Troy Ettel; Carl Nordman] have confirmed that conversion to other managed forest types continues to be a threat. While these other forest types may provide an acceptable habitat for some species, their establishment is threatening the existing longleaf pine areas. It is possible to harvest in and sustainably manage longleaf pine systems [Source: 227, Expert: Troy Ettel] and therefore timber management by itself is not considered a threat. Other threats include fire-suppression, urban development, fragmentation, non-native species, intensive pine straw raking, and climate change [Sources: 45,41,42,40].

Risk Designation: Specified risk for the entire CBA

Sources of Information:

44. Cape Fear Arch Conservation Collaboration. A Collaborative Voice for Nature. Retrieved from <http://capefeararch.org/about/>
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39. U.S. Department of the Interior Southeast Climate Science Center. Insular Ecosystems of the Southeastern United States: A Regional Synthesis to Support Biodiversity Conservation in a Changing Climate. 2016. Retrieved from <https://pubs.usgs.gov/pp/1828/pp1828.pdf>
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225. Longleaf Alliance. Proceedings of the Fourth Longleaf Alliance Regional Conference. Longleaf Alliance Report No. 6. 2003. Retrieved from http://www.auburn.edu/academic/forestry_wildlife/lpsdl/pdfs/4th_Combined.pdf
226. The Longleaf Alliance. Herbicides. Retrieved from <https://www.longleafalliance.org/what-we-do/restoration-management/herbicides>
227. Rachel E. Greene, Raymond B. Igley, Kristine O. Evans, Darren A. Miller, T. Bently Wigley, Sam K. Riffell. 2016. A meta-analysis of biodiversity responses to management of southeastern pine forests—opportunities for open pine conservation. *Forest Ecology and Management* 360: 30–39

Experts Consulted:

- Troy Ettel, The Nature Conservancy
- Carl Nordman, NatureServe

Florida Panhandle CBA

FSC Region: Southeast

Description: The Florida Panhandle is reported to be one of the 5 richest biodiversity hotspots in North America. Of particular importance is the richness of frogs (27 species), snakes (42 species) and turtles (18 species) [Source: 49]. This concentration of biodiversity is driven by the river systems (particularly the Apalachicola River), longleaf pine savanna habitat and unique steephead ravines. Species of particular interest include the Okaloosa darter (*Etheostoma okaloosae*) which is endemic to the Florida Panhandle, and the Red-cockaded Woodpecker (*Picoides borealis*) which is associated with the longleaf pine.

Biodiversity richness within the Apalachicola system is 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.

Historically longleaf pine savanna supported incredibly high species richness, with up to 150 species of plants per hectare. Longleaf pine habitats were historically maintained by fire and biodiversity values are driven in part by the resulting understory plant community. Eglin Air Force Base within this CBA includes one of the largest remaining longleaf pine forests under single ownership.

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.

Indication of Risk:

- Apalachicola Bay/River System – Threats to this aquatic system are varied and include persistent drought resulting in reduced flow level, loss of floodplain and wetland habitat due to reduced flow levels, point and non-point source pollution (including sediments from forestry operations due to insufficient ground cover and inadequate buffers), unrestrained growth and development. [Sources: 50,51] The Apalachicola River and Bay Surface Water Improvement and Management Plan identifies implementation of silvicultural Best Management Practices (BMPs) as a significant component of one of its priority projects [Source: 256].
- Longleaf Pine Savanna – Biodiversity values can be adversely affected by forest management activities via conversion of longleaf to other pine types, and the use management techniques, including herbicide application that have the potential to inhibit native understory communities. [Expert: Troy Ettel] As the bulk of the biodiversity exists in the understory of a longleaf pine system, restoration or maintenance of understory species composition is an essential component of longleaf pine conservation. While herbicides can be an essential tool in restoration of longleaf pine, there is mixed evidence regarding the impact of herbicides on understory vegetation – different chemicals and application methods may have differing affects. [Sources: 225,226] Other threats include fire-suppression, urban development, fragmentation, non-native species, and climate change [Sources: 41,42,40,53]. The Florida Wildlife Action Plan [Source: 54] did not identify Forestry practices as a threat to Sandhill habitats (dominated by longleaf pine), but did find them to be a high source of stress for Natural pineland habitats (also dominated by longleaf pine) and regional experts [Troy Ettel; Carl Nordman] have confirmed that conversion to other managed forest types continues to be a threat. While these other forest types may provide an acceptable habitat for some species, their establishment is threatening the existing longleaf pine areas. It is possible to harvest in and sustainably manage longleaf pine systems [Source: 227, Expert: Troy Ettel] and therefore timber management by itself is not considered a threat. Both Sandhill and Natural pineland habitats are documented within the CBA [Source: 57]
- Steephead Ravines – Reported threats include altered hydrologic regimes, conversion to other land uses, fire suppression. Forestry practices were identified as a low source of stress to the habitat in the Florida Wildlife Action Plan. [Source: 54]

Risk Designation: Specified risk for the entire CBA

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56. Northwest Florida Environmental Conservancy. Steepheads. Retrieved from <http://www.nwflec.com/northwestfloridaenvironmentalconservancypart2/id12.html>
57. Florida Fish and Wildlife Research Institute. Florida's Wildlife Legacy Initiative (mapping application for the Florida Wildlife Action Plan and other Florida conservation initiatives). Retrieved from <http://ocean.floridamarine.org/FWLI/>
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Experts Consulted:

- Troy Ettel, The Nature Conservancy
- Carl Nordman, NatureServe

Central Florida CBA

FSC Region: Southeast

Description: As in other areas of the southern US, native pine ecosystems are an important driver for biodiversity in this CBA. Pine flatwoods in Central Florida are associated with xeric uplands/sandhills that provide a range of biodiversity values. Longleaf pine is the dominant tree species in pine flatwoods, however as with other longleaf pine systems, the native plant diversity is one of the most significant components of the overall biodiversity. Rare wildlife supported by this habitat include Florida black bear (*Ursus americanus floridanus*), Florida panther (*Felis concolor coryi*), Southeastern kestrel (*Falco sparverius paulus*), Red-cockaded Woodpecker (*Picoides borealis*), Florida sandhill crane (*Grus canadensis pratensis*), Bald eagle (*Haliaeetus leucocephalus*), eastern indigo snake (*Drymarshon corais couperi*), and Chapman's rododendron (*Rhododendron chapmanii*).

The two polygons that compose this CBA are in areas that receive the highest possible scores in an assessment of Florida's biodiversity hotspots, they include top priority areas from the Florida Critical Lands and Waters Identification Project, and also represent other spatial priorities (e.g., landscape integrity, rare species habitat conservation, strategic habitat conservation areas).

Indication of Risk: Reported threats to Pine flatwoods include conversion to agriculture and pine plantations, alteration of fire regimes, non-native species, hydrologic alteration, substrate disturbance (Wiregrass may not withstand disturbance associated with planting pine), invasion by melaleuca if logged and over drained, and recreational damage [59,60,61]. Forestry practices were identified as a high source of stress to the natural pineland habitat in the Florida Wildlife Action Plan, in association with the following stresses which all had high ranks for the habitat: Altered fire regime, Altered hydrologic regime, Habitat destruction or conversion, Altered community structure, Altered species composition/dominance, and Fragmentation of habitats, communities, ecosystems [Source: 59].

Risk Designation: Specified risk for the entire CBA (both polygons)

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58. University of Florida IFAS Extension. Florida Forest Stewardship, Pine Flatwoods. Retrieved from http://www.sfrc.ufl.edu/extension/florida_forestry_information/forest_resources/pine_flatwoods.html
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Southern Florida CBA

FSC Region: Southeast

Description: This CBA consists primarily of the Everglades region and urban and suburban portions of the city of Miami. The Everglades are the largest subtropical wilderness in the United States - a highly biodiverse area in part due to the diversity of the landscape, including uplands that are primarily rockland communities, freshwater wetland communities, and microalgae communities.

Indication of Risk: The Everglades portion of the CBA is protected as a National Park and the majority of the remainder of the CBA occurs primarily in urban and developed areas (agriculture and other development) with very little extent of forested communities and therefore where normal forest management is unlikely to be occurring [Source: 57].

Risk Designation: Low Risk

Sources of Information:

64. U.S. National Park Service. Everglades National Park – America's Everglades – the largest subtropical wilderness in the United States. Retrieved from (<https://www.nps.gov/ever/index.htm>)

65. U.S. Fish & Wildlife Service. Multi-Species Recovery Plan for South Florida, The South Florida Ecosystem. Retrieved from <https://www.fws.gov/verobeach/MSRPPDFs/SFecosystem.pdf>

57. Florida Fish and Wildlife Research Institute. Florida's Wildlife Legacy Initiative (mapping application for the Florida Wildlife Action Plan and other Florida conservation initiatives). Retrieved from <http://ocean.floridamarine.org/FWLI/>

INDIVIDUAL SPECIES

While HCV1 does not typically include individual occurrences of a single species, it does include situations where a single rare species population is concentrated or where an endemic species with very limited distribution exists and therefore the area is significant at a global, regional or national level.

Legislative Protections for Critically Imperiled Species in the United States:

The federal Endangered Species Act (ESA) was enacted by Congress in 1973 to protect imperiled plant and animal species. Under the ESA, the federal government has the responsibility to protect species that are likely to become extinct throughout all or a large portion of their range (endangered species), species that are likely to become endangered in the near future (threatened species), and critical habitat vital to the survival of endangered or threatened species. The ESA has been extremely successful in keeping listed species from

becoming extinct – less than 1% of the species listed are now extinct and has also been successful in recovering imperiled species¹⁴.

However, there are also significant concerns about the ESA. It is the responsibility of the U.S. Fish & Wildlife Service (USFWS) to identify critical habitat and develop recovery plans for listed species. Analysis has shown that species with critical habitat designated and completed recovery plans are more likely to have improving population trends and less likely be declining, compared to species without these¹⁵. However, due to limited resources, USFWS has not been able to complete both of these tasks for all listed species.

And there is great concern about how many imperiled species are not getting listed and therefore not receiving the successful protections of the ESA. NatureServe maintains the most comprehensive dataset of imperiled species in the United States – tracking more than 28,000 species and 9,000 subspecies, using standardized criteria for identifying occurrences and for determining species status. However, only around 20% of the species NatureServe defines as ‘imperiled’ are federally listed, with an emphasis on terrestrial vertebrate species¹⁶ (aquatic and invertebrate species are typically less well understood, and considered less gregarious, thereby drawing less attention from the human population as a whole).

The above described evidence and expert opinion [Daniel Hall¹⁷; Annika Terrana¹⁸] indicate that current implementation of the ESA does not protect all species that fall within HCV 1. Challenges relate primarily to: 1) delayed or incomplete implementation of the federal ESA, particularly on private lands in some states and ii) Inconsistent listing of important species that meet ESA criteria, due to backlogged listing processes or competing priorities.

Forty-six of the 50 states have some kind of endangered species legislation and while they provide some back-up to the ESA, and in some states help to fill in where the ESA doesn’t, they vary greatly from state to state. Most provide some kind of process for ‘listing’ species at the state scale and prohibit the ‘take’ and/or trafficking of these species, but many fewer go further and also protect the habitat of these species¹⁹.

Therefore, between the limits of the federal Endangered Species Act and the inconsistencies between the state level protections, it is not possible to conclude that the most imperiled species (HCV1) are comprehensively protected by law. Therefore, individual species must be considered within the context of HCV 1 for the NRA.

Data Used for HCV Identification:

Consistent data regarding status of individual species are virtually impossible to find for the entire assessment area. The most consistent source of information on species occurrences, imperilment and conservation needs in North America is the NatureServe dataset²⁰. This dataset provides the framework for identification of HCV1 species for the NRA. The NRA WG identified the following criteria as part of their identification HCV 1 species: level of imperilment, rarity, vertebrate species, and forest habitat dependency.

¹⁴ Suckling, K., Mehrhoff, L.A., Beam, R., and Hartl, B. 2016 A Wild Success: A Systematic Review of Bird Recovery Under the Endangered Species Act. Center for Biological Diversity. (<http://www.esasuccess.org/pdfs/WildSuccess.pdf>)

¹⁵ Taylor, M.F.J., Suckling, K.F., and Rachlinski, J.J. 2005. The Effectiveness of the Endangered Species Act: A Quantitative Analysis. *BioScience*. 55:4, pp. 360-367. (<http://www.biologicaldiversity.org/campaigns/esa/pdfs/bioscience2005.pdf>)

¹⁶ Evans, D.M., Che-Castaldo, J.P., Crouse, D., Davis, F.W., Epanchin-Niell, R., Flather, C.H., Frohlich, R.K., Goble, D.D., Li, Y.-W., Male, T.D., Master, L.L., Moskwik, M.P., Neel, M.C., Noon, B.R., Parmesan, C., Schwartz, M.W., Scott, J.M., and Williams, B.K. 2016. Species Recovery in the United States: Increasing the Effectiveness of the Endangered Species Act. *Ecological Society of America. Issues in Ecology, Report 20*. (<https://www.esa.org/esa/wp-content/uploads/2016/01/Issue20.pdf>)

¹⁷ Environmental Consultant

¹⁸ World Wildlife Fund

¹⁹ George, S. and Snape, W.J. III. 2010. State Endangered Species Acts. In Baur, D.C. and Irvin, W.R., eds. 2010. *Endangered Species Act: Law, Policy, and Perspectives*. Chicago, IL: American Bar Association: 344-359. (<http://www.biologicaldiversity.org/publications/papers/StateEndangeredSpeciesActs.pdf>)

²⁰ NatureServe Explorer: An Online Encyclopedia of Life (<http://explorer.natureserve.org>)

These criteria were applied by FSC US staff in a standardized manner (developed in consultation with the current Working Group and Experts: Dominick Dellasala²¹, James Strittholt²²) to filter out HCV 1 species from the NatureServe dataset:

- **Imperilment-Rarity-Vertebrate:** 156 vertebrate species with a G1 conservation status rank (critically imperiled at a global scale) and either an S1 conservation status rank (critically imperiled at a state scale) in at least one state or an S2 conservation status rank (imperiled at a state scale) in at least one state were identified from the NatureServe dataset. Any species with an S4 or S5 conservation status rank (apparently secure or secure, respectfully, at a state scale) in any state were removed.
- **Forest Habitat Dependency:** The above species were then filtered by the habitat associations provided by the NatureServe dataset – species were retained if the Terrestrial habitats included anything labeled as ‘Forest’ or ‘Woodland’ or if the Palustrine habitats included anything labeled as ‘Forested Wetland’ or ‘Riparian.’ The remaining species were further filtered through review of habitat information available in the associated NatureServe Species Account, or additional information sources as needed. This filtering process identified 20 species.
- Finally, species were filtered by recency of confirmed occurrences – species were retained if there was a formal documented occurrence within the last 20 years. Following this filtering process, 19 species remained and are included in this assessment as HCV 1 species.

Species that made it through the first filter (Imperilment-Rarity-Vertebrate), but not the second (Forest Habitat Dependency) could also potentially be considered HCV 1 species, but they would all be classified as ‘Low Risk’ as they are not forest dependent, and therefore unlikely to be threatened by forest management activities. These species are not specifically identified in the assessment below, but are listed in Annex F.

Following the above filtering process, NatureServe species accounts and other information sources were reviewed to determine known threats for the remaining species. Species for which identified threats did not include forest management activities or species for which there was one primary threat that was not related to forest management activities and all other threats were insignificant as a result were given ‘Low Risk’ designations. Species with documented threats from forest management activities and those for which it was not possible to determine threats were given ‘Specified Risk’ designations for specific spatial areas. For listed species, the current range as designated by the listing authority was used for the specified risk area. For other species, counties with known occurrences were used. The county scale was chosen to provide as a scale at which it would be relatively easy for a certificate holder to determine whether or not the area of specified risk intersected with their supply area and as a scale that would most likely capture the area in which forest management activities could be having an effect on the species in question. If a certificate holder wishes to do so, they could work with local Natural Heritage Network partners and/or local conservation organizations to develop a more refined area of occurrence and influence by forest management activities.

Summary of Risk Designations for Identified HCV 1 Species:

| HCV 1 Species | FSC US Region ²³ | Risk Designation |
|---------------|-----------------------------|------------------|
|---------------|-----------------------------|------------------|

²¹ Geos Institute

²² Conservation Biology Institute

²³ See Annex B for a map of FSC US Regions

| | | |
|--------------------------------------|---------------|---|
| Lesser Slender Salamander | Pacific Coast | Specified Risk for current range as defined by CDFW |
| Relictual Slender Salamander | Pacific Coast | Low Risk |
| Scott Bar Salamander | Pacific Coast | Low Risk |
| Sierra Buttes Salamander | Pacific Coast | Low Risk |
| Southern Mountain Yellow-legged Frog | Pacific Coast | Low Risk |
| California Condor | Pacific Coast | Low Risk |
| Island Scrub-jay | Pacific Coast | Low Risk |
| Black-spotted Newt | Southwest | Low Risk |
| Robust Cottontail | Southwest | Low Risk |
| Cheoah Bald Salamander | Appalachian | Low Risk |
| Spring Pygmy Sunfish | Southeast | Low Risk |
| Waccamaw Killifish | Southeast | Low Risk |
| Dusky Gopher Frog | Southeast | Specified Risk for current critical habitat in Mississippi, as defined by USFWS |
| Houston Toad | Southeast | Specified Risk for current critical habitat, as defined by USFWS |
| Patch-nosed Salamander | Southeast | Specified Risk for Stephens and Habersham Counties, GA and Oconee County, SC |
| Rim Rock Crowned Snake | Southeast | Low Risk |
| Black-capped Petrel | Southeast | Low Risk |
| Florida Bonneted Bat | Southeast | Low Risk |
| Red Wolf | Southeast | Low Risk |

Lesser Slender Salamander (*Batrachoseps minor*)

FSC Region: Pacific Coast, specifically San Luis Obispo County, CA.

Description: The Lesser Slender Salamander has a restricted distribution in the southern Santa Lucia Range of north-central San Luis Obispo County, CA, generally above 400m. For more information, contact the California Department of Fish and Wildlife.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (California); Forest & woodland habitats; Little is known about this species and specific threats have not yet been documented. However, the species depends on forest habitat and down woody debris is likely an important habitat element [Source 70], which can be affected by forest management, and therefore the precautionary approach should be taken.

Risk Designation: Specified Risk for the current range, as defined by the California Department of Fish & Wildlife [Source: 71]

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Batrachoseps+minor>
71. California Department of Fish and Wildlife. California Wildlife Habitat Relationships System. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=1524&inline=1>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/59129/0>

Relictual Slender Salamander (*Batrachoseps relictus*)

FSC Region: Pacific Coast, specifically Kern County, CA

Description: The Relictual Slender Salamander's known historical range includes the vicinity of Breckenridge Mountain, in the southern Sierra Nevada of CA, including the lower Kern River Canyon and higher elevations on Breckenridge Mountain. The historical range spans only 15 kilometers, and the two known extant populations are less than 5 kilometers apart. The species occurs mainly in heavily forested areas in mixed pine-fir-incense cedar forests. For more information, contact the California Department of Fish and Wildlife.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (California); Conifer Forest/Riparian; Little is known about this species and specific threats have not yet been documented. However, the species depends on forest habitat and down woody debris is likely an important habitat element [Source 70], which can be affected by forest management. The entire known range of this species occurs within an Inventoried Roadless Area within the Sequoia National Forest (see the HCV 3 Roadless Areas assessment for details on the effective protection that this designation provides).

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Batrachoseps+relictus>
71. California Department of Fish and Wildlife. California Wildlife Habitat Relationships System. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=1513&inline=1>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/2650/0>
258. U.S. Forest Service. Sequoia National Forest Inventoried Roadless Areas Map. 2000. Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_058780.pdf

Scott Bar Salamander (*Plethodon asupak*)

FSC Region: Pacific Coast, specifically Siskiyou County, CA

Description: The Scott Bar Salamander is known from a few locations in northern California: Walker Gulch, Muck-a-Muck Creek above Scott Bar, and Mill Creek. It is associated with

cool and moist talus slopes on a northern facing exposure within mature and old-growth forest and breeds terrestrially. Little is known about the species. For more information, contact the California Department of Fish and Wildlife.

Federal/State Listing Status: Listed as threatened in the State of California.

Indication of Risk: G1G2; S1S2 (California); Forest, woodland & riparian habitats; While there is agreement that the species is associated with talus slopes within forested areas, there is conflicting evidence as to whether it is associated with late successional forest, and to what extent it is affected by forest management activities. The species occurs on both federal and private lands and 10% of its range is within Inventoried Roadless Areas, and 51% of its range is in a reserve designation that withdraws those lands from timber harvest, and another 19% occurs within retention areas where commercial timber management is also restricted. Only 30% of the species' range is within the General Matrix portions of national forests and on private lands where timber management might occur. However, as a listed species in the State of California, the surveys and protective actions are required as part of the Timber Harvest Plan (THP) review process prior to harvests on private lands. A petition was put forward in 2004 to list the species (along with the Siskiyou Mountains Salamander) under the Federal Endangered Species Act, but the listing was found to be unwarranted for both species, primarily due to the protections already in place. A new petition for listing the Siskiyou Mountains Salamander was submitted in 2018 by the same organizations, providing rationale of changes in forest practice rules in the State of Oregon, but the Scott Bar Salamander was not included in the second petition. [Source: 72,73,229,230]

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Plethodon+asupak>
71. California Department of Fish and Wildlife. California Wildlife Habitat Relationships System. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=1538&inline=1>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/61904/0>
73. U.S. Fish & Wildlife Service, Yreka Fish and Wildlife Office. Local Species Information – Siskiyou Mountains (*Plethodon stormi*) and Scott Bar (*Plethodon asupak*) Salamanders. 2013. Retrieved from <https://www.fws.gov/yreka/plethodonspecies.html>
174. California Department of Fish and Wildlife. California's Wildlife. Retrieved from <https://www.wildlife.ca.gov/Data/CWHR/Life-History-and-Range>
229. Federal Register. Vol. 73, No. 16, January 24, 2008, 12-Month Finding on a Petition to List the Siskiyou Mountains Salamander (*Plethodon stormi*) and Scott Bar Salamander (*Plethodon asupak*) as Threatened or Endangered. Retrieved from <https://www.gpo.gov/fdsys/pkg/FR-2008-01-24/pdf/E8-918.pdf>
230. DeGross, D.J. and Bury, R.B. Science Review for the Scott Bar Salamander (*Plethodon asupak*) and the Siskiyou Mountains Salamander (*P. stormi*): Biology, Taxonomy, Habitat, and Detection Probabilities/Occupancy. US Department of the Interior, US Geological Survey. Open-File Report 2007-1352. 2007. Retrieved from <https://pubs.usgs.gov/of/2007/1352/pdf/OFR20071352.pdf>

Sierra Buttes Salamander (*Hydromantes sp. 3*)

FSC Region: Pacific Coast, specifically northern California

Description: The Sierra Buttes Salamander is known from only one isolated small area in Sierra County, CA. They have a very limited home ranges and there are no known threats.

Federal/State Listing Status: Not listed

Indication of Risk: G1Q; S1 (California); Riparian habitat; No current threats identified and the area in which the population exists is unlikely to be developed [Source: 70].

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from
<http://explorer.natureserve.org/servlet/NatureServe?searchName=Hydromantes+sp.+3>

Southern Mountain Yellow-legged Frog (*Rana muscosa*)

FSC Region: Pacific Coast, specifically southern California

Description: The Southern Mountain Yellow-legged Frog occurs in the southern Sierra Nevada mountains of California and in the mountains in southern California. It is found on/in sunny riverbanks, meadow streams, isolated pools, and lake borders in the Sierra Nevada, along with cool rocky stream courses fed by springs and snow melt in southern California. At high elevations, they may be inactive for 7-9 months of the year.

Federal/State Listing Status: Federally endangered in the U.S. in southern California.

Indication of Risk: G1; S1 (California); Riparian habitat; Threats to the frog include non-native fish introductions, disease, introduction of contaminants, livestock grazing, human use in and along streams, hydrologic alterations, climate change and vulnerability to catastrophic events. [Source: 70,72] No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

74. US Fish & Wildlife Service. Environmental Conservation Online System. Retrieved from <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D02H>
71. California Department of Fish and Wildlife. California Wildlife Habitat Relationships System. Retrieved from <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=1502&inline=1>
70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Rana+muscosa>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/19177/0>

California Condor (*Gymnogyps californianus*)

FSC Region: Pacific Coast

Description: The California Condor's large range includes rocky, open-country scrubland, coniferous forests and oak savanna. It uses cliffs, rocky outcrops and large trees as nesting

sites, but overall forest does not appear to be a limiting factor. The bird can travel large distances to search for carrion for feeding.

Federal/State Listing Status: Federally endangered in the U.S., except where listed as an experimental population. The bird is also listed as endangered by the State of California.

Indication of Risk: G1; S1 (California, Arizona); Woodland habitats; Current and historical threats are primarily from toxins, with the current major threat being lead poisoning from ammunition [Sources: 75,74,70,72]. No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

75. California Department of Fish and Wildlife. California Condor. Retrieved from <https://www.wildlife.ca.gov/Conservation/Birds/California-Condor>

74. US Fish & Wildlife Service. Environmental Conservation Online System. Retrieved from <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B002>

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Gymnogyps+californianus>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/22697636/0>

Island Scrub-jay (*Aphelocoma insularis*)

FSC Region: Pacific Coast, specifically Santa Cruz Island, CA

Description: The Island Scrub-jay is found on Santa Cruz Island in the Channel Islands, California. The breeding population is relatively stable. Habitat comments specify 'open' woodland areas.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (California); Woodland habitat; Habitat degradation caused by introduced livestock is a historical threat to the bird. Changes in vegetation (e.g., due to grazing or lack of grazing) can threaten the food supply and the species' small range makes it vulnerable to localized disasters, disease and non-native species invasion [Sources: 76,70]. No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

76. National Audubon Society. Guide to North American Birds. Retrieved from <http://www.audubon.org/field-guide/bird/island-scrub-jay>

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Aphelocoma+insularis>

Robust Cottontail (*Sylvilagus robustus*)

FSC Region: Southwest

Description: The Robust Cottontail has a small range in Texas, New Mexico and Mexico. It occurs at higher elevations and has disappeared from two of the four mountain ranges where it was known to occur.

Federal/State Listing Status: Not listed

Indication of Risk: G1G2; S1 (New Mexico); Forest & woodland habitats; The species is likely sensitive to drought and climate change may therefore be a threat. Habitat destruction from urbanization, development, cattle grazing and brush clearing are reducing the available habitat [Sources: 70,72]. No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

77. Animal Diversity Web. *Sylvilagus robustus* – robust cottontail. 2012. Retrieved from http://animaldiversity.org/accounts/Sylvilagus_robustus/

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from

<http://explorer.natureserve.org/servlet/NatureServe?searchName=Sylvilagus+robustus>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/41310/0>

Cheoah Bald Salamander (*Plethodon cheoah*)

FSC Region: Appalachian, specifically the Cheoah Bald area in Graham and Swain Counties, NC

Description: The Cheoah Bald Salamander's range is not yet well defined, but it is believed to be limited a portion of the Appalachian Mountains at the very western extent of North Carolina within the elevational range of 975-1,524 meters, associated with the Cheoah Bald. The salamander is endemic to the mesic forests that occur on the bald and may be common in suitable habitat. It appears that much of the species' range may occur within the Nantahala National Forest and it is identified as a Federal Species of Concern. For more information, contact the North Carolina Natural Heritage Program or the Nantahala National Forest.

Federal/State Listing Status: Not listed

Indication of Risk: G1G2; S1S2 (North Carolina); Forest & woodland habitats; Clear cutting is a major threat to local populations. Some populations have been found in second growth forests, providing evidence that they are able to re-populate after harvest, but literature suggests it takes decades and with so few known populations extant [Source: 70], that kind of disruption could have a significant effect on the species as a whole. The 1994 Amendment to the Nantahala National Forest Plan included new definitions of management areas that provide an indication of whether timber management will likely occur [Source: 231]. The Cheoah Bald area is located within management areas that at this time either do not allow timber management, or are identified as being likely unsuitable for timber management [Sources: 232,233]. However, as the species' range is not yet fully delineated, it is not possible to know whether all or most of the range occurs within these management areas.

Risk Designation: Specified Risk for the entirety of Graham and Swain Counties, NC

Sources of Information:

70. 1 NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Plethodon+cheoah>
82. 2 North Carolina Natural Heritage Program. Species/Community Search. Retrieved from <https://www.ncnhp.org/data/species-community-search>
72. 3 International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/59333/0>
231. 4 USDA Forest Service. Land and Resource Management Plan, Amendment 5. Nantahala and Pisgah National Forests. 1994. Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_050373.pdf
232. 5 USDA Forest Service. Nantahala National Forest Management Area Map. Nantahala and Pisgah National Forests. Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_050374.pdf
233. 6 USDA Forest Service. Summary of Management Areas. Nantahala and Pisgah National Forests. Retrieved from <https://www.fs.usda.gov/detail/nfsnc/landmanagement/planning/?cid=stelprdb5194769>
139. 7 North Carolina Wildlife Resources Commission. North Carolina Wildlife Action Plan. 2015. Retrieved from http://ncwildlife.org/Portals/0/Conserving/documents/2015WildlifeActionPlan/NC-WAP_2015_ePDF_052016_chapters1-8.pdf

Spring Pygmy Sunfish (*Elassoma alabamae*)

FSC Region: Southeast

Description: The spring pygmy sunfish is known to exist in one spring complex in the Tennessee River watershed. It relies on dense underwater vegetation for both shelter and hunting grounds.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (Alabama); Forested wetland habitat; Identified threats are changes to hydrology and decreased water quality due to incompatible land management activities in the surrounding agricultural and pasture lands [Sources: 83,70,72]. No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

83. Center for Biological Diversity. Spring Pygmy Sunfish. Retrieved from http://www.biologicaldiversity.org/species/fish/spring_pygmy_sunfish/index.html
70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Elassoma+alabamae>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/202436/0>

Waccamaw Killifish (*Fundulus waccamensis*)

FSC Region: Southeast, specifically Lake Waccamaw and its tributaries in Columbus County, NC

Description: Waccamaw Killifish range is limited to Lake Waccamaw and its tributaries in eastern North Carolina. The fish is very common within its small range and this combined with the population size suggests that the population is either stable or declining at a very slow rate. For more information, contact the North Carolina Natural Heritage Program.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (North Carolina); Forested Wetland habitat; No major threats are currently believed to exist. Greatest conservation concern is related to septic tank runoff causing eutrophication. It is also noted that upland deforestation and consequent siltation could negatively affect demersal eggs, however, deforestation is not considered to be a normal forest management activity. Therefore, it is not considered a meaningful risk to the Waccamaw Killifish habitat from forest management activities. Additionally, the species' habitat is indirectly protected by designation as critical habitat for another species under the U.S. Endangered Species Act. [Source: 70]

Risk Designation: Low Risk

Sources of Information:

- 70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Fundulus+waccamensis>
- 82. North Carolina Natural Heritage Program. Species/Community Search. Retrieved from <http://ncnhde.natureserve.org/content/map>
- 72 International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/8709/0>

Dusky Gopher Frog (*Lithobates sevosus*)

FSC Region: Southeast, specifically the lower coastal plain of Mississippi.

Description: The Dusky Gopher Frog historically occurred on the Coastal Plain from eastern Louisiana to the Mobile River delta in Alabama. Now, it is only known from one site in Harrison County and a couple of sites in Jackson County, MS, although there are also active efforts to reintroduce into wetlands in Perry County. Occurs in upland areas of sandy soils that were historically forested with longleaf pine and in the temporary wetland breeding sites that are embedded within the forested landscape. Most of life is spend in or near underground refugia that were historically gopher tortoise burrows. Critical habitat was designated in 2012 within four counties in Mississippi and one in Louisiana. Current populations are documented in two of the Mississippi Counties (Harrison and Jackson) and active efforts toward reintroduction are occurring in the third (Perry). The species has not been documented in Louisiana since 1967 and there is no evidence of active reintroduction efforts. For more information, contact the Mississippi Department of Wildlife, Fisheries, and Parks.

Federal/State Listing Status: Federally endangered wherever found. Also listed as endangered by the State of Mississippi.

Indication of Risk: G1; S1 (Mississippi); Woodland, forested wetland & riparian habitats; Major threats include population isolation, urbanization, disease, and a lack of suitable habitat. Habitat degradation is a significant factor, driven by multiple sources including,

changes in forest type from longleaf pine to other forest types, forest degradation caused by grazing and the disruption of the natural fire regime, and land management practices that alter the soil horizon, forest litter, herbaceous community and the occurrence of down woody debris. Timber site prep and other forestry practices that alter temporary wetlands can damage breeding areas. [Sources: 70,72]

Risk Designation: Specified Risk for the critical habitat, as defined by the U.S. Fish & Wildlife Service [Source: 176], with the exception of the polygon in Louisiana.

Sources of Information:

- 70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Lithobates+sevosus>
- 84. MS Department of Wildlife, Fisheries, and Parks & MS Museum of Natural Science. Endangered Species of Mississippi, page 56. 2014. Retrieved from http://www.mdwfp.com/media/3231/endangered_species_of_mississippi.pdf
- 72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/58714/0>
- 176. US Fish & Wildlife Service. Environmental Conservation Online System Species Profile for Dusky Gopher Frog. Retrieved from <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D031>
- 234. USDOF Fish & Wildlife Service. Dusky Gopher Frog (*Rana sevosa*) Recovery Plan. 2015. Retrieved from [https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20\(1\).pdf](https://ecos.fws.gov/docs/recovery_plan/2015_07_16_Final%20RP_R_sevosa_08212015%20(1).pdf)
- 235. USDA Forest Service. Land and Resource Management Plan. National Forests in Mississippi. 2014. Retrieved from https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3814664.pdf

Houston Toad (*Anaxyrus houstonensis*)

FSC Region: Southeast, specifically southeast Texas

Description: The Houston Toad is native to the central coastal region of Texas. Populations have been found in nine counties, with the largest in Bastrop County. The species is restricted to areas with soft sandy soils, typically with pine forest. Breeding sites include shallow water of roadside ditches, temporary ponds in residential areas and pastures, and other seasonally flooded low spots where water persists for at least 60 days. For more information, contact the Fish and Wildlife Service in Texas.

Federal/State Listing Status: Federally endangered wherever found. Also listed as endangered by the State of Texas.

Indication of Risk: G1; S1 (Texas); Forest & woodland habitats; Habitat conversion poses the most serious threat. Some forestry practices, such as thinning and burning, may benefit the toad, while others, such as clear cutting, are harmful. Other threats include prolonged drought and the presence of fire ants. [Source: 86]

Risk Designation: Specified Risk for the current critical habitat, as defined by U.S. Fish & Wildlife Service [Source: 177]

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Anaxyrus+houstonensis>
177. US Fish & Wildlife Service. Environmental Conservation Online System Species Profile for Houston toad. Retrieved from <http://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=D004>
85. U.S. Fish & Wildlife Service. Houston Toad Recovery Plan. 1984. Retrieved from https://ecos.fws.gov/docs/recovery_plan/840917.pdf
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/3170/0>
86. U.S. Fish & Wildlife Service. Endangered Species Houston Toad. 2009. Retrieved from <http://ifw2es.fws.gov/HoustonToad>

Patch-nosed Salamander (*Urspelerpes brucei*)

FSC Region: Southeast, specifically Stephens and Habersham Counties, GA and the Tugaloo River in Oconee County, SC.

Description: The known range of the Patch-nosed Salamander is a small, first order stream located at the foot of the Blue Ridge escarpment in Stephens County, GA. For more information, contact the Georgia Department of Natural Resources, Wildlife Resources Division.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1 (Georgia); Riparian habitat; Little is known about this species and specific threats have not yet been documented. However, any factor that would disrupt water flow, canopy cover, or leaf-litter layer would likely impact the species [Sources: 70,72]. As all of these can potentially be affected by forest management, the precautionary approach should be taken.

Risk Designation: Specified Risk for the entirety of Stephens and Habersham Counties, GA and Oconee County, SC

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Urspelerpes+brucei>
87. Georgia DNR Wildlife Resources Division. Species Distribution Map Retrieved from http://gakrakow.github.io/range_maps2.html
88. Georgia DNR Wildlife Resources Division. Species Profile for Patch-nosed Salamander. 2011. Retrieved from http://georgiawildlife.com/sites/default/files/uploads/wildlife/nongame/pdf/accounts/amphibians/urspelerpes_brucei.pdf
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/summary/185664/0>

Rim Rock Crowned Snake (*Tantilla oolitica*)

FSC Region: Southeast, specifically southern Florida

Description: The Rim Rock Crowned Snake are known to occur in various locations in and around Miami and the Florida Keys. Little is known about its diet and life history.

Federal/State Listing Status: Listed as threatened by the State of Florida.

Indication of Risk: G1G2; S1S2 (Florida); Forest & woodland habitats; Occurs in highly populated areas of Florida where forest management is unlikely to be occurring. Primary threats are intensive development and other disturbances (e.g., alteration of natural hydrological and fire regimes). [Source: 70] No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

89. Florida Fish and Wildlife Conservation Commission. Rim Rock crowned snake. Retrieved from <http://myfwc.com/wildlifehabitats/imperiled/profiles/reptiles/rim-rock-crowned-snake/>

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Tantilla+oolitica>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/63954/0>

Black-capped Petrel (*Pterodroma hasitata*)

FSC Region: Southeast

Description: The bird's primary habitat is open ocean and only U.S. observations are at sea off the southeastern states. Nesting sites are located outside of the United States. Current threats to the Black-capped Petrel are primarily habitat loss in Caribbean countries.

Federal/State Listing Status: Not listed

Indication of Risk: G1; S1N (North Carolina); Forest & woodland habitats; Species does not use forests within the assessment area, and therefore it is unlikely to be threatened by forest management activities within the assessment area [Source: 70].

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Pterodroma+hasitata>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/22698092/0>

76. National Audubon Society. Guide to North American Birds. Retrieved from <https://www.audubon.org/bird-guide> <http://www.audubon.org/field-guide/bird/black-capped-petrel>

Florida Bonneted Bat (*Eumops floridanus*)

FSC Region: Southeast, specifically south Florida

Description: Florida Bonneted Bats are rare and only occur in a few counties in south Florida. They have been found foraging in a wide variety of forested and non-forested habitats, in both natural and man-made areas.

Federal/State Listing Status: Federally endangered wherever found.

Indication of Risk: G1; S1 (Florida); Forest, woodland & riparian habitats; Vulnerable to ongoing loss and degradation of habitat and extirpation of local roosting populations due to human activities, climate change, stochastic events such as hurricanes and effects of non-native species [Sources: 74,70,72]. No substantive threats from forest management activities identified.

Risk Designation: Low Risk

Sources of Information:

89. Florida Fish and Wildlife Conservation Commission. Retrieved from <http://myfwc.com/wildlifehabitats/imperiled/profiles/mammals/florida-bonneted-bat/>

74. US Fish & Wildlife Service. Environmental Conservation Online System. Retrieved from <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0JB>

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Eumops+floridanus>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/136433/0>

Red Wolf (*Canis rufus*)

FSC Region: Southeast, specifically eastern NC

Description: Red wolf is currently only known to exist in a limited area of eastern North Carolina, occupying the peninsula between the Albemarle and Pamlico Sounds. The wolf is common within the reintroduction area, but the occurrence outside of this area is unknown. For more information, contact the North Carolina Natural Heritage Program.

Federal/State Listing Status: Federally endangered wherever found, except where listed as an experimental population. Listed as endangered by the State of North Carolina.

Indication of Risk: G1Q; S1 (North Carolina, South Carolina); Forest, woodland, forested wetland & riparian habitats; Historical decline was due in part to habitat loss, but it is considered a habitat generalist that can thrive in forested and non-forested habitats. Current threats are hybridization with coyotes (primary), climate change (only population is on a peninsula, 3 ft above sea level), human induced mortality, and habitat loss and fragmentation due to urbanization/development [Sources: 70,72].

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=Canis+rufus>

72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/3747/0>

82. North Carolina Natural Heritage Program. Species/Community Search. Retrieved from <http://ncnhp.org/data/species-community-search>

90. US Fish & Wildlife Service. Red Wolf Program Review. Retrieved from <https://www.fws.gov/redwolf/evaluation.html>
74. US Fish & Wildlife Service. Environmental Conservation Online System. Retrieved from <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A00F>

Black-spotted Newt (*Notophthalmus meridionalis*)

FSC Region: Southwest, specifically along the Gulf Coastal Plain of Texas

Description: Black-spotted Newts are known from a small number of sites in Texas and Mexico, although their distribution may have been much greater historically. They breed temporary ponds, roadside ditches and pools of small streams – with a preference for warm, shallow waters with vegetative cover. Adults are associated with deep, poorly drained, clayey sediments that are more likely to form ephemeral ponds or wetlands following heavy rain. For more information, contact the Texas Parks and Wildlife Department.

Federal/State Listing Status: Listed as threatened by the State of Texas.

Indication of Risk: G1; S2 (Texas); Riparian habitat. Much of the species' original habitat has been converted to agricultural lands or through urban development. Additionally, insecticide and herbicide use is identified as a significant threat. [Sources: 70,72,236,237,238] No threats from forest management identified.

Risk Designation: Low Risk

Sources of Information:

70. NatureServe. NatureServe Explorer: An Online Encyclopedia of Life. Retrieved from <http://explorer.natureserve.org/servlet/NatureServe?searchName=notophthalmus+meridionalis>
72. International Union for Conservation of Nature and Natural Resources. The IUCN Red List of Threatened Species. Retrieved from <http://www.iucnredlist.org/details/59452/0>
236. AmphibiaWeb. *Notophthalmus meridionalis*. Retrieved from <https://amphibiaweb.org/species/4263>
237. Herps of Texas. Black-spotted Newt. Retrieved from <http://www.herpssoftexas.org/content/black-spotted-newt>
238. Texas Parks and Wildlife Magazine. Wild Thing: Orange Bellies. 2016. Retrieved from https://tpwmagazine.com/archive/2016/aug/scout5_wildthing_newt/

HCV 2 – Landscape-Level Ecosystems and Mosaics

FSC considers materials that come from places where High Conservation Values are threatened by forest management activities to be unacceptable materials. Therefore, the NRA assesses the risk of sourcing from these kinds of areas.

HCV 2 Definitions:

FSC-PRO-60-002a (NRA Framework): “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 Forest Management Standard: “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.”

Common Guidance for the Identification of HCV²⁴ - HCV 2:

- 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.

Given the above definitions and guidance, the following assessment of HCV focuses on large forested landscapes that are significant at global, regional or national scales.

For the purposes of this risk assessment, the following thought process is applied:

1. *Are HCV 2 present? – If no, the area is designated ‘Low Risk.’ If yes, go to #2.*
2. *Is the HCV 2 threatened by forest management activities? – If no, the area is designated ‘Low Risk.’ If yes, the area is designated ‘Specified Risk.’*

Landscape-Level Forests

NOTE: *As clarified at the very beginning of this document, Roadless Areas are considered HCV 3 within the context of the assessment area, due to their rarity and typical small size.*

Pre-European colonization, Native Americans managed the US landscapes in a way that resulted in extensive mosaics of agriculture, grassland, savanna, woodlands and forests. Just prior to European colonization, the US is estimated to have been 46% forested. By 1910, about a third of that forest was gone (primarily converted to agriculture), and most of the remaining forest had been harvest at least once. The original nature of much of this forest will never return, as actively managed forests are generally not allowed to reach fully mature conditions when the forests themselves are driving the soil characteristics, light intensities and moisture levels to which the full complement of biodiversity would be adapted. This means that our modern forests typically contain much less biodiversity than their predecessors, and this is exacerbated further by intensive management and continued forest fragmentation. [Sources: 178,179] As a result, HCV 2 forests are fairly limited in the assessment area and generally occur in areas that are less accessible for harvest or

²⁴ 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

development and/or have greater protections that limit development and commercial harvesting.

Data Used for HCV Identification:

In its HCV 2 assessment for the original National Risk Assessment Working Group (NRA WG), The Nature Conservancy (TNC) considered the following datasets [Source: 3]:

- TNC Matrix Forest Blocks²⁵: 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.”²⁵ This dataset only covers a limited section of the eastern US.
- Northwest Forest Plan Land Use Allocation²⁶: 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 are limited to public lands.

However, TNC ultimately did not include these datasets because neither of them fit the full definition of HCV 2 and also because of their limited spatial extent. However, TNC concluded that the Greenpeace/ WRI Intact Forest Landscapes dataset [Source: 4] is reasonably robust, given that it is relatively straightforward to identify intact forest using remote sensing. Additionally, the description of areas identified by this dataset (see below) closely aligns with the above definitions of HCV 2. Therefore, this dataset is used in the following assessment as a proxy for all HCV 2 in the assessment area, as it effectively describes all HCV 2 in the US.

Description: For the purposes of the dataset, an Intact Forest Landscape (IFL) is described as 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. The conservation value of IFLs is great due to their carbon storage, protection of biodiversity, regulation of hydrological regimes, and other essential ecosystem functions that they provide. [Source: 94]

Indication of Risk:

- Eastern Conterminous US: The IFL in the dataset only occur in three areas – within the Adirondack management area in upstate New York, within the Okefenokee National Wildlife Refuge in southeastern Georgia, and within the Everglades on the southern tip of Florida. The areas in New York and Georgia occur on land that is permanently protected (GAP Status 1 or 2). Most of the Everglades area is permanently protected within a National Park. However, there is an IFL located just north of the National Park within the Big Cypress National Preserve (established in 1974). While the Big Cypress swamp area is not Gap Status 1 or 2 (i.e., permanently protected), it has been managed as part of a broader plan to protect the entire Everglades system, which includes managing the forest to protect the hydrology of the greater Everglades region and to improve or restore natural communities. [Sources: 97,98,100] In 2002, a National Park Service suitability assessment identified that about a third of the Preserve likely met criteria for Federal Wilderness Area protection – indicating that the management of this area has effectively

²⁵ <http://databasin.org/datasets/68c240fb9dc14fda8ccd965064fb3321>

²⁶ <http://databasin.org/datasets/5570316b9f174178a652136bac47ae4c>

protected the ecosystem [Source: 180]. Therefore, it is possible to conclude that this area is unlikely to be threatened by forest management activities.

- Western Conterminous US: The IFL in the dataset occur largely within permanently protected areas, but some also occur outside of the Gap Status 1 or 2 areas. Almost all of the IFL that are not permanently protected occur within Inventoried Roadless Areas on lands managed by the U.S. Forest Service which are legislatively protected from timber harvest. There is one significant exception in northwestern Wyoming – an area that is part of the Wind River Reservation and is located within the White Reservation Roadless Area, which has been effectively protected by the Tribe since 1934 (as is evidenced by its continued roadless status 80 years later). [Sources: 99,100]

As detailed in the HCV 3 assessment, Inventoried Roadless Areas are covered by the 'Roadless Rule' which was signed into law in 2001 and prohibits timber harvesting except in very specific circumstances, which are almost all for improving the quality and function of the ecological system. The Roadless Rule is considered to be very successful – it has limited the road building on the 58.5 million acres of roadless areas to only 75 miles and has logging to only a tiny fraction, and this was mostly outside of the assessment area for this NRA. [Sources: 101,102] Therefore, it is unlikely that these areas are threatened by forest management activities.

Risk Designation: Low Risk

Sources of Information:

94. Intact Forest Landscapes. Overview. Retrieved from <http://intactforests.org/index.html>
4. Potapov P., Yaroshenko A., Turubanova S., Dubinin M., Laestadius L., Thies C., Aksenov D., Egorov A., Yesipova Y., Glushkov I., Karpachevskiy M., Kostikova A., Manisha A., Tsybikova E., Zhuravleva I. 2008. Mapping the World's Intact Forest Landscapes by Remote Sensing. Ecology and Society, 13 (2). (<http://www.intactforests.org>; 'IFL for year 2013' datalayer used in this assessment)
3. Fargione, J., Platt, J., Schneebeck, C., and McRae, B. 2014. Mapping High Conservation Value Forests in the United States: Methodology and Data Sources. A Report by The Nature Conservancy for the Forest Stewardship Council-US. (Available upon request from Forest Stewardship Council US)
97. U.S. National Park Service. Big Cypress National Preserve, Florida. Retrieved from <https://www.nps.gov/bicy/index.htm>
98. Florida Fish and Wildlife Conservation Commission. A Management Plan for the Everglades Complex of Wildlife Management Areas 2015-2020. 2015. Retrieved from <http://myfwc.com/media/4055870/EvergladesComplexManagementPlan.pdf>
99. Aragon, Don. The Wind River Indian Tribes. International Journal of Wilderness. 2007. Retrieved from http://www.wilderness.net/library/documents/IJWAug07_Aragon.pdf
100. US Geological Survey. US-Protected Areas Database. Retrieved from <http://gapanalysis.usgs.gov/padus/>
101. U.S. Forest Service. 2001 Roadless Rule. Retrieved from <https://www.fs.usda.gov/roadmain/roadless/2001roadlessrule>
102. Anderson, Michael. The Wilderness Society. The Roadless Rule: A Tenth Anniversary Assessment. Retrieved from <https://wilderness.org/sites/default/files/Roadless-Rule-paper-10th-anniversary.pdf>

178. Bronaugh, W. North American Forests in the Age of Man. American Forests Magazine. 2012. Retrieved from <http://www.americanforests.org/magazine/article/north-american-forests-in-the-age-of-man/>
179. U.S. Forest Resource Facts and Historical Trends. United States Department of Agriculture. 2014. Retrieved from https://www.fia.fs.fed.us/library/brochures/docs/2012/ForestFacts_1952-2012_English.pdf
180. US National Park Service. 2002-2003 Annual NPS Wilderness Report. 2003. Retrieved from https://www.wilderness.net/NWPS/documents/NPS/2002-2003_wilderness_report.pdf

HCV 3 – Ecosystems and Habitats

FSC considers materials that come from places where High Conservation Values are threatened by forest management activities to be unacceptable materials. Therefore, the NRA assesses the risk of sourcing from these kinds of areas.

HCV 3 Definitions:

FSC-PRO-60-002a (NRA Framework): “Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.”

FSC-US Forest Management Standard: “HCV forest areas that are in or contain rare, threatened or endangered ecosystems.” HCV 3 includes old growth, primary forests, roadless areas (without evidence of roads or skid trails and greater than 500 acres or that have unique attributes), and other ecosystems that are considered ‘rare’ at a global, regional, or local (state) level. HCV 3 old growth includes both Type 1 (stands that have never been logged and that display late successional/old growth characteristics) and Type 2 (stands that have been logged, but that retain significant late-successional/old growth structure and functions). Primary forests (a forest ecosystem with the principal characteristics and key elements of native ecosystems that is relatively undisturbed by human activity) are generally synonymous with old growth forests.

Common Guidance for the Identification of HCV²⁷ - HCV 3:

Ecosystems that are:

- 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.

²⁷ 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

- Classified as threatened in national or international systems (such as the IUCN Red List of Ecosystems)

Given the above definitions and guidance, the following assessment of HCV focuses on old growth forests (including primary forest), roadless areas and other rare forested ecosystems with an overall emphasis on systems that are significant at global, regional or national scales.

For the purposes of this risk assessment, the following thought process is applied:

- 3. Are HCV 3 present? – If no, the area is designated 'Low Risk.' If yes, go to #2.*
- 4. Is the HCV 3 threatened by forest management activities? – If no, the area is designated 'Low Risk.' If yes, the area is designated 'Specified Risk.'*

Old Growth Forest (including Primary Forest)

Data Used for HCV Identification:

Late successional (Old Growth) data considered in this assessment 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 areas with an increased likelihood of late successional forest. However, they were not developed using consistent methodologies and do cover the entire assessment area, and therefore cannot be used to develop a complete picture of the assessment area. They are also not spatially explicit maps of late successional forest. The LANDFIRE data set²⁸ was also considered, but even with additional analysis completed by The Nature Conservancy²⁹, was found by the original FSC US NRA Working Group (NRA WG) to have too great a potential for false positives to be considered for this assessment.

Based upon the above datalayers, the NRA WG concluded that old growth has a high enough likelihood of occurrence outside of protected areas in the Pacific Coast and Rocky Mountain regions (see Annex B for FSC regions) that they should be fully assessed as part of the NRA.

Ultimately, FSC US staff, in consultation with experts [Dominick Dellasala, James Strittholt] and the current Working Group developed an alternate methodology for identifying areas with a higher likelihood of containing Old-Growth for the Pacific Coast and Rocky Mountains Regions. The methodology was a step-wise filtering process that began with an above ground forest biomass data layer (developed by the U.S. Forest Service³⁰). The first step was to apply ecoregion-specific thresholds (based upon a literature search), followed by removal of areas within perimeters of fires since 2000 (U.S. Geological Survey³¹), and then removal of areas with recent forest gain or forest loss (Global Forest Watch³²). Finally, removal of areas with GAP Status 1 or 2 protections (PAD-US dataset³³), Inventoried

²⁸ LANDFIRE, Landscape Fire and Resource Management Planning Tools, is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, (<https://www.landfire.gov/>)

²⁹ Mapping High Conservation Value Forests in the United States: Methodology and Data Sources, By The Nature Conservancy for the Forest Stewardship Council-US (available upon request from FSC US)

³⁰ <https://data.fs.usda.gov/geodata/rastergateway/biomass/index.php>

³¹ https://rmgsc.cr.usgs.gov/outgoing/GeoMAC/historic_fire_data/

³² <http://data.globalforestwatch.org/datasets/tree-cover-loss-hansenumdgoogleusgsnasa>

³³ <https://gapanalysis.usgs.gov/padus/data/download/>

Roadless Areas (U.S. Forest Service³⁴) or conservation easements with an environmental purpose (Natural Resources Conservation Service³⁵).

The inclusion of old growth forest in the assessment also addresses forest types (e.g., coastal temperate rainforest) in the Pacific Coast and Rocky Mountain region that prior to European settlement would have existed predominantly as late-successional forest, due to their natural disturbance regime. When Old Growth, HCV 3 Priority Forest Types, and HCV 1 Critical Biodiversity Areas are considered together, they align well with the forested WWF Global 200 Ecoregions in the U.S.

Description: Old growth forests are highly important to human populations for ecological, social and economic reasons. There is no single, widely accepted definition, but this assessment uses the definitions of Type 1 and Type 2 Old Growth in the FSC US Forest Management Standard (which focus on forests that have not been disturbed and do not include areas of re-growth that are now mature). Most definitions, including the FSC US definitions, focus on old trees and structural complexity. These habitat characteristics are important to a number of rare species that depend upon western U.S. old growth forests, including Northern Spotted Owls, Marbled Murrelet, and American marten, along with much lesser known (and appreciated) species of land snails, mollusks, and amphibians.

Old growth forest is generally considered to be rare, but how rare depends on the part of the country being considered: in the Pacific Northwest (including Northern California), the estimate is that old growth constitutes approximately 6% of the existing forest, in the northeast, it's less than 1%, while in the southeast it's closer to 0.5% and even less in the southwest and Great Lakes [Source: 106].

Old growth forests are important in maintaining biodiversity, values for society, and ecological services such as carbon sequestration and soil quality. A comprehensive spatial inventory of old growth forests across the entire US does not exist, though old growth forests are much less common in the eastern United States [Source: 106]. They are much more abundant on public lands in the western United States and a few inventories of old growth forest in the Pacific Northwest and northern California exist. [Source: 107, 108, 109, 110]

Indication of Risk:

- Eastern conterminous U.S. (FSC US Great Lakes, Northeast, Ozark-Ouachita, Appalachian, Southeast and Mississippi Alluvial Valley Regions): The remaining pockets of old growth (as defined by FSC US) are more often than not on public lands and generally are in some kind of protective designation, or exist in areas that are inaccessible for forest management. [Source: 106; Experts: Dominick Dellasala, James Strittholt]
- Western conterminous U.S. (FSC US Pacific Coast, Rocky Mountain and Southwest Regions): Threats to old growth forests include a lack of managing younger forests with a goal of creating old growth forests, timber harvest, invasive species, pests, pathogens, forest fragmentation, fire suppression, catastrophic wildfires and climate change. [Source: 106,111; Experts: Dominick Dellasala, James Strittholt] In frequent-fire forests of the western US, logging is no longer the primary threat to old growth, instead threats also include land management policies that suppress fire and do not mimic the effects of fire through active management [Sources: 106,112]. In the Southwest, fires suppression remains the greatest threat, along with invasive species, climate change and development [106]. While the Northwest Forest Plan has significantly reduced the loss of Old Growth to timber harvest on federal lands guided by the plan (all within the Pacific Coast Region), losses continue at lower

³⁴ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

³⁵ <https://www.conservationeasement.us/downloads/?created=true>

rates. Additionally, losses on non-federal lands in the Northwest, particularly private lands, have continued at much higher rates than on federal lands. Supporting evidence of these conclusions and generally that Old Growth in the Northwest is still being lost to timber harvest can be found in status assessments for species that are dependent upon late successional forests. [Sources: 104,116,117,121,161,239,240; Experts: Dominick Dellasala, James Strittholt]

Risk Designation: Specified risk for lands in the Pacific Coast and Rocky Mountain regions that were identified through the filtering methodology described above. Low risk for the remainder of the assessment area.

Sources of Information:

106. National Commission on Science for Sustainable Forestry. Beyond Old Growth: Older Forests in a Changing World. 2008. Retrieved from <http://andrewsforest.oregonstate.edu/sites/default/files/lter/pubs/pdf/pub4524.pdf>
107. Conservation Biology Institute. Old Growth Forests in the Pacific Northwest, USA. 2010. Retrieved from <https://databasin.org/galleries/90e11cbab3724db2aa801e67643d9151>
108. Conservation Biology Institute. Late seral forest on private lands for the Klamath-Siskiyou ecoregion. 2010. Retrieved from <https://databasin.org/datasets/806a5cf3afc04778a6aa34725a757857>
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116. Desimone, S.M. 2016. Periodic Status Review for the Marbled Murrelet in Washington. Washington Department of Fish and Wildlife, Wildlife Program. 36 pp.
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121. Marbled Murrelet (*Brachyramphus marmoratus*) 5-Year Review. 2009. US Fish & Wildlife Service. 108 pp.
161. Status Review of the Marbled Murrelet (*Brachyramphus marmoratus*) in Oregon and Evaluation of Criteria to Reclassify the Species from Threatened to Endangered under the Oregon Endangered Species Act. 2018. Oregon Department of Fish & Wildlife. 134 pp.
239. U.S. Fish & Wildlife Service. Status Review of the Northern Spotted Owl, Frequently Asked Questions. Retrieved from <https://www.fws.gov/oregonfwo/Species/Data/NorthernSpottedOwl/Documents/FAQ90-dayPetition4-7-15.pdf>

240. California Fish and Game Commission. Notice of Findings: Listing the northern spotted owl as a threatened species is warranted. 2017. Retrieved from <http://www.fgc.ca.gov/CESA/index.aspx>

Experts Consulted:

- Dominick Dellasala, Geos Institute
- James Strittholt, Conservation Biology Institute

Roadless Areas

NOTE: *As clarified at the very beginning of this document, Roadless Areas are considered HCV 3 within the context of the assessment area, due to their rarity and typical small size.*

Data Used for HCV Identification:

There is no comprehensive, consistent data set available for roadless areas within the assessment area. The NRA WG worked with TNC to explore various options for identifying roadless areas³⁶. A number of existing data sets, including the U.S. Census Bureau's TIGER road dataset³⁷, and more novel analyses developed by TNC, were considered, but were assessed by the NRA WG to include too many occurrences of false positives, based upon the FSC US Forest Management Standard's definition of roadless area, which includes the absence of forest roads and skid trails. The NRA WG concluded that roadless areas were best represented in this assessment by official federal datasets of inventoried roadless areas on U.S. Forest Service (USFS) administered lands³⁸ and Wilderness Study Areas on Bureau of Land Management (BLM) administered lands³⁹. These data sets are both vetted by agency staff and can be confidently assessed to represent roadless areas.

To help confirm the NRA WG's conclusion, FSC US staff consulted with science and land management staff at a number of regional and state land conservancies throughout the assessment area. These experts were asked about the potential for roadless areas, as defined by the FSC US Forest Management Standard, to occur on forested private lands that are not permanently protected and not FSC forest management certified (i.e., places outside of public lands where these HCV would not already be protected).

Description: The 'Roadless Rule' was signed into law in 2001. It prohibits road construction, road reconstruction and timber harvesting on 58.5 million acres of inventoried roadless areas on National Forests, except in very specific circumstances. These are in addition to 35 million acres of Congressionally-designated Wilderness Areas that are permanently protected and frequently adjacent to the inventoried roadless areas. By law, the extremely limited circumstances under which harvest may occur within these roadless areas are almost all associated with management actions designed to improve the character and function of the ecological system. The Roadless Rule has been even more successful than even the U.S. Forest Service predicted it would be. In 10 years, only 75 miles of roads were built within inventoried roadless areas, and only a miniscule fraction were logged, and those were mostly outside of the assessment area. In its Tenth Anniversary Assessment of the Roadless Rule, The Wilderness Society (TWS) concludes that the Roadless Rule has been very effective in preventing new road building within inventoried roadless areas. The TWS assessment also concludes that the Rule has been effective in stopping commercial logging within inventoried roadless areas – the major exception to this that TWS identified was in

³⁶ Mapping High Conservation Value Forests in the United States: Methodology and Data Sources, By The Nature Conservancy for the Forest Stewardship Council-US (available by request from FSC US)

³⁷ <https://www.census.gov/geo/maps-data/data/tiger-line.html>

³⁸ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

³⁹ <http://databasin.org/datasets/eea0e495148b446594356982001c458c>

Alaska's Tongass National Forest, which is outside of this NRA's assessment area.
[Sources: 101,102]

While inventoried roadless areas received extensive court challenges, these have been resolved – concluding with the U.S. Supreme Court in 2016 declining to hear a final challenge from the State of Alaska. This decision confirmed the federal Ninth Circuit court's ruling, and reinforced the settled rule that federal agencies cannot arbitrarily change policies and ignore previous factual findings simply because a new president has taken office.
[Source: 118]

In 1980, The BLM completed an inventory of all lands it managed, looking for large, natural areas with outstanding opportunities for solitude or primitive and unconfined recreation (and as a result, generally roadless). These areas were assessed and for suitability as Congressionally-designated Wilderness Areas, and those deemed suitable were proposed to Congress. A large portion of these have been protected by Congress, and the 538,405 acres that remain are in Wilderness Study Areas (WSA) status. The BLM's policy on management of WSAs directs BLM staff to "manage and protect WSAs to preserve wilderness characteristics so as not to impair the suitability of such areas for designation by Congress as wilderness" including prohibiting new surface disturbances that are not completed with the intent to maintain or improve conditions. [Sources: 118,119]

Indication of Risk:

- A spatial assessment of the 'forest zone' data layer that is packaged with Greenpeace's Intact Forest Landscapes data layers and the BLM's Wilderness Study Areas data layer indicates that very few WSAs occur within the identified forested zones [Sources: 91,115]. Therefore, it is unlikely that they will be threatened by forest management activities.
- Under federal law (Roadless Rule), timber harvest is not currently allowed within Inventoried Roadless Areas on National Forests [Source: 101]. Even though they do not have permanent legal protection, evidence suggests that the Roadless Rule has been very successful in maintaining the roadless character of these areas, and in severely limiting timber harvest [Source: 102]. Therefore, they are unlikely to be threatened by forest management activities.
- Expert consultation suggests that in most regions of the assessment area, lands that meet the FSC US Forest Management Standard's roadless criteria are believed to either no longer exist or to be so rare as to be functionally unidentifiable. One expert noted that at least in northern forested regions, large land holdings are typically heavily managed and therefore heavily roaded. Another noted that while the roads and skid trails may not have been used recently, the evidence of them still exists and they will be used again in the future. For those rare roadless areas greater than 500 acres that do occur on forested private lands that are not permanently protected, it was noted that these would most likely occur in areas that are too inaccessible or of such low productivity that logging of these areas is unlikely a risk. Therefore, while there may be a very small number of roadless areas that meet the FSC US Forest Management Standard criteria on private lands within the assessment area that are not permanently protected, it is unlikely that they are actively threatened by forest management activities.

Risk Designation: Low Risk

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115. Conservation Biology Institute. Wilderness Study Area - USA, October 2012. 2013. Retrieved from <http://databasin.org/datasets/eea0e495148b446594356982001c458c>

Experts Consulted:

- Marisa Riggi, Northeast Wilderness Trust
- Karin Heiman, Southeast Regional Land Conservancy
- Dave Werntz, Conservation Northwest
- David Whitehouse, The Conservation Fund
- David Kirk, Wilderness Land Trust
- Tina Hall, The Nature Conservancy in Michigan
- John McNulty, Seven Islands Land Company
- John Gunn, University of New Hampshire, Dept. of Natural Resources & Environment

PRIORITY FOREST TYPES

Data Used for HCV Identification:

Priority Forest Types were developed by the NRA WG using the FSC US Forest Management Standard as guidance in addition to the HCV Resource Network guidance and additional stakeholder input. These Priority Forest Types are regionally defined (see Annex B for FSC regions).

Potential Priority Forest Types in the Pacific Coast and Rocky Mountain regions that are by definition Old Growth (e.g. Old Growth Douglas Fir stands) and/or that prior to European settlement would have existed predominantly as late-successional forest due to their natural disturbance regime (e.g., coastal temperate rainforest) are not included here as Priority Forest Types, but instead are addressed through the Old Growth assessment described above. While the following forest types were initially identified by the original Working Group using guidance associated with the FSC US Forest Management Standard as a framework, they were reviewed for potential gaps using the forested WWF Global 200 ecoregions in the U.S. as a framework, but no significant gaps were identified when these Priority Forest Types were considered in conjunction with HCV 3 Old Growth (including Coastal Temperate Rainforest), and the forest types associated with the HCV 1 Critical Biodiversity Areas (e.g., the Mixed Mesophytic Forests of the Central Appalachian CBA and the coniferous forests of the Klamath-Siskiyou and Sierra Nevada CBAs).

Summary of Risk Designations for identified HCV 3 Priority Forest Types:

| Priority Forest Type | FSC US Region ⁴⁰ | Risk Designation |
|--|---|--|
| Mesophytic Cove Sites | Appalachian | Specified Risk for the portion of the Appalachian region that occurs within the WWF-defined Appalachian & Mixed Mesophytic Forests ecoregion, and above 300 meters elevation |
| Native Spruce-Fir | Appalachian | Low Risk |
| Late Successional Bottomland Hardwoods | Southeast/ Mississippi Alluvial Valley | Specified Risk for the portions of the Southeast and Mississippi Alluvial regions that are within the identified extent of the forest type |
| Native Longleaf Pine Systems | Southeast | Specified Risk for Counties that are identified in Figure 1 of the Range-wide Longleaf Conservation Plan as having 10,000 or more acres of Longleaf Pine |

Mesophytic Cove Sites

FSC Region: Appalachian

Description: Mesophytic cove sites are highly diverse, closed-canopy hardwood forest occurring on mesic, sheltered sites (coves) at low- to moderate-elevation (300-1,100 m / 1000-3600 ft), and sometimes higher. They tend to occur in large patches (tens to hundreds of acres) on concave slopes that accumulate nutrients and moisture. These kinds of areas occur within the portion of the FSC US Appalachian region that is within the WWF Global 200 Appalachian & Mixed Mesophytic Forests ecoregion. They are characterized by high diversity and often great structural complexity. The ground level flora in particular has high species richness, often with abundant spring ephemerals. The forests often have a dense canopy, dominated by hardwoods with conifers also present. They are distinct and different from a homogenous yellow-poplar grove. Rich cove forests have very fertile soils with a diverse herb layer and contain few shrubs in the midstory. Acidic cove forests are less fertile than rich coves and typically have a thick evergreen midstory (rhododendron, etc.) that results in less diversity on the forest floor, but are otherwise similar - they have more acidic soils and more shrubs. [Sources: 125,241] This forest type can be defined using NatureServe's Ecological Classification Standard⁴¹ for the following ecological systems (with the first typically occurring west of the Allegheny Front, and the second occurring to the east):

- South Central Interior Mesophytic Forest (CES 202.887)
- Southern and Central Appalachian Cove Forest (CES 202.373) – this type includes both 'acidic' and 'rich' coves

While the sheltered, mesic sites that support Cove Forests are not particularly rare, examples are very rare that retain structural components like the dense canopy and high species diversity (both in the overstory and understory) – characteristics that may take 200

⁴⁰ See Annex B for a map of FSC US Regions

⁴¹ NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 February 2009. (http://downloads.natureserve.org/get_data/data_sets/veg_data/nsDescriptions.pdf)

years to initially develop. These sites will not have evidence of having been previously clear-cut or farmed (followed by regrowth of the forest). Typically, they will include basswood, buckeye, cucumber, walnut, and magnolias in the mid-story and yellow-poplar, beech, sugar maple, northern red oak, white oak, ash, and hickories in the overstory.

Southern Blue Ridge Mountains Cove Forest was identified as a priority habitat in the 2005 North Carolina Wildlife Action Plan. Both Acidic and Rich Cove Forests are considered to be rare natural communities in Virginia. 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. Other associated species of concern include red wolf, Roan Mountain Sedge, Addison's Leatherflower, Blomquist Leafy Liverwort, Bluish Veilwort, Appalachian blue violet, blue wild indigo, Tellico salamander, Peaks of Otter salamander, and bog turtle. [Sources: 124,125,126,130,242; Experts: Greg Meade, Andrew Goldberg, Christopher Reeves]

Indication of Risk: The most significant current threats to this forest type are invasive species and conversion to other uses. However, threats also include incompatible forest management that results in alterations to the structure and composition of the forest or conversion to other forest types (white pine), climate change, chronic deer herbivory, harvesting of herbs and pollution [Sources: 124,125,127,129; Expert: Andrew Goldberg]. Mesophytic Cove Forest sites can be managed in a compatible way using methods that do not disturb soil productivity, hydrology or the understory, that maintain the diversity of the overstory without losing oak or moving toward monocultures of maple or poplar, that limit openings and that don't result in 'high-grading' the forest (removing all trees of high commercial value and leaving the remainder). Incompatible forest management occurs when these guidelines are not followed and remains a threat to these systems in the Appalachian region. [Source: 243; Expert: Andrew Goldberg].

While less severe disturbances, such as logging and fire, may not reduce herbaceous species richness or diversity to the same extent as more severe disturbances like mining and agriculture, they can still affect herbaceous species composition or abundance and therefore the quality and functioning of the system. Overall, the magnitude of impact from activities that occur within these sites on the herbaceous species are directly proportional to severity of disturbance. [Source: 127]

Risk Designation: Specified Risk for the portions of the Appalachian region that are within the WWF Global 200 Appalachian & Mixed Mesophytic Forests ecoregion, occur above 300 m elevation, and that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in the PAD-US⁴² dataset and USFS Inventoried Roadless Areas⁴³).

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Experts Consulted:

- Greg Meade, The Nature Conservancy
- Andrew Goldberg, Rainforest Alliance (formerly Dogwood Alliance)
- Christopher Reeves, IKEA (formerly University of Kentucky Extension)

Native Spruce-Fir Forests

FSC Region: Appalachian

Description: Comprised of native Red Spruce and Fraser Fir, these habitats occur on Appalachian mountaintops, generally above 4,500 feet in elevation in West Virginia, Virginia, Tennessee and North Carolina. They are a rare boreal forest type that are isolated from other boreal forest types and provide necessary habitat to endemic high-elevation species. They differ from similar forests further north due to less frequent fires, being less continuously cold and much wetter (i.e., rain and fog tend to concentrate on the mountain tops), and inclusion southern US associated species. This forest type can be defined using

NatureServe's Ecological Classification Standard⁴⁴ for Central and Southern Appalachian Spruce-Fir Forest (CES 202.028). [Sources: 124,133]

Spruce and Fir Forests are considered to be a rare natural community in Virginia, an endangered community in North Carolina, as well as being rare globally [Sources: 130,132,133]. They provide habitat for the federally and state listed northern flying squirrel, as well as other species of concern, including pygmy salamanders, Weller's salamanders and snowshoe hare.

Indication of Risk: Forests dominated by Fraser fir is significantly threatened by air pollution and invasive species (balsam woolly adelgid). Other threats include climate change, catastrophic fire, and development [Sources: 132,133]. Due to the rarity and threatened nature of this forest type, it is a conservation priority and typically occurs in areas that are managed for restoration of the ecological community and/or are protected [Expert: Andrew Goldberg]. In North Carolina, an estimated 91% of the existing extent is in some kind of conservation ownership [Source: 134].

Risk Designation: Low Risk

Sources of Information:

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Expert Consulted: Andrew Goldberg, Rainforest Alliance (formerly Dogwood Alliance)

Late Successional Bottomland Hardwoods

FSC Region: Southeast, Mississippi Alluvial Valley

Description: Bottomland Hardwoods are floodplain forests that are periodically inundated or saturated. Hydrology drives the entire ecosystem and means that even small changes can result in very significant effects on the system. Much of the original bottomland hardwood in the US has been cleared for agriculture, particularly so in the Mississippi valley, and much of the forest has been mismanaged – leaving very few examples of intact late successional forest. [Sources: 135,139,141,143] 'Bottomland Hardwoods' as a category includes a

⁴⁴ NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 February 2009. (http://downloads.natureserve.org/get_data/data_sets/veg_data/nsDescriptions.pdf)

number of different species associations that vary depending primarily upon the extent of flooding (e.g., permanently flooded cypress swamps vs slightly drier, temporarily flooded forests dominated by oak), but also soil characteristics, detrital decomposition rates, soil and water pH, nutrient availability and turnover rates, flood depth and water velocity, light intensity, and disturbance. Bottomland hardwoods do not have very distinct seral stages defined by significant changes in species composition, but instead maintain most of the same species, with slight shifts in composition. Therefore, a late successional stand is not defined by the species, as much as by the structural composition (e.g., more stratification) and existence of large wood debris, including standing hollow trees – these changes occur at about 80 years in most Bottomland hardwood types and perhaps a little later in cypress swamps. While old Bottomland Hardwood stands are not particularly rare, the late successional stands, with characteristics as previously described, are quite rare, due to a history of selective clear-cutting and high-grading. Those that are a little drier (slightly higher up the banks) are rarer than the permanently flooded cypress swamps, due to greater historical access for timber management and conversion to agriculture. However, even the wettest sites are now seeing increased harvest, due to increased demand for materials. [Sources: 244,245; Experts: Mike Aust, David Stahle, Jeff Marcus, Bob Kellison, Mike Schafale]

All bottomland hardwoods are important to biodiversity, but the rarity of occurrences and extremely diverse stand conditions of the late successional forests make them particularly important. Woody species diversity can be comparable to the most diverse upland forests in the US. They tend to have structurally complex vegetation and a deep litter layer. The dense vegetation and the landscape connectivity they provide make them important travel corridors for wildlife. This forest type also supports some of the densest breeding populations of imperiled migratory song birds in the eastern U.S., including Swainson's Warbler, Prothonotary warblers, and Red-eyed vireo. Other species of concern include Ivory-billed woodpecker and Louisiana black bear. [Sources: 135,139,140,143,144]

Bottomland hardwoods in the Coastal Plain and Mississippi Alluvial Valley have some similarities, but also differ in some significant ways. In the Coastal Plain areas, bottomland hardwoods tend to occur in more narrow bands that follow a river or stream, whereas in the Mississippi Alluvial Valley, they extend much greater distances from the river/stream, resulting in much larger areas of the forest type. There are also differences between the two regions in land use histories, forest successional patterns, forest product markets and other attributes. There are some similarities in tree species associated with the systems in these two regions, but also differences. [Source: 135,138] Overall, the forest type includes a wide array of tree species (more than 70 species), with species composition at any particular site driven by the local processes and disturbance regimes (e.g., gradient of flooding: infrequently vs. occasionally vs. permanently). [Source: 135,137,138,141]

This forest type can be defined using NatureServe's Ecological Classification Standard⁴⁵ for the following ecological systems (but for the purposes of this assessment is also limited to late successional occurrences):

- Southern Coastal Plain Blackwater River Floodplain Forest (CES 203.493)
- Southern Piedmont Large Floodplain Forest (CES 202.324)
- Southern Piedmont Small Floodplain and Riparian Forest (CES 202.323)
- South-Central Interior Large Floodplain (CES 202.705)
- Southern Atlantic Coastal Plain Large River Floodplain Forest (CES 203.066)
- West Gulf Coastal Plain Large River Floodplain Forest (CES 203.488)

⁴⁵ NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 February 2009. (http://downloads.natureserve.org/get_data/data_sets/veg_data/nsDescriptions.pdf)

- West Gulf Coastal Plain Small Stream and River Forest (CES 203.487)
- Mississippi River Bottomland Depression (CES 203.490)
- Mississippi River High Floodplain (Bottomland) Forest (CES 203.196)
- Mississippi River Low Floodplain (Bottomland) Forest (CES 203.195)
- Mississippi River Riparian Forest (CES 203.190)

'Late successional' is typically defined as beginning at around 80 years of age [Sources: 141,142; Experts: Mike Aust, David Stahle, Mike Schafale]. For the purposes of this assessment, 'late successional' refers to bottomland hardwoods that are at least 80 years old and have the complex structural characteristics associated with late successional stands, but are not necessarily Old Growth (as defined in the FSC US Forest Management Standard).

Indication of Risk: Significant threats include development, changes to hydrology (droughts, water withdraws, ditching), incompatible forest management (results in changes to canopy age and structure, to hydrology and to available dead and down woody debris), pollution, fragmentation, climate change, invasive species (including spread that is exacerbated by logging activities), and economic drivers that alter forest management goals (i.e., economic drivers that increase harvest rates and demands for materials, resulting in pressure to harvest in places/in ways that aren't appropriate). [Sources: 135,139] Changes to the vegetative cover in these systems can significantly affect hydrologic flow, and therefore change the entire system [Source: 135,137,138,139,141,144; Expert: Mike Schafale].

Forest management occurring within bottomland hardwoods is not necessarily in itself a threat, but how the management is applied, particularly in the context of the local landscape, is the most significant concern [Sources: 135,136,140,144]. The professionals responsible for managing these forests are frequently trained with a focus on upland silviculture, but those same techniques can have ecologically damaging effects when applied in bottomland hardwood system, due to the different disturbance regimes, ecosystem dynamics and regeneration needs. [Source: 135]

As with the overall characteristics of the system, there are also some differences in threats between the Coastal Plain and Mississippi Alluvial Valley. In the Mississippi Valley, the river-driven seasonal flooding allows management activities to occur in relatively dry conditions, and silvicultural treatments can generate positive ecological and economic impacts. In contrast, bottomland hardwood forests in the Coastal Plain may not have the same opportunities for dependable, seasonable dry periods and are more often treated under challenging (wet) conditions than those in the Mississippi Alluvial Valley; therefore, clearcut silviculture (resulting in significant change to the vegetative cover) is more commonly implemented to meet economic and ecological goals. In the Coastal Plains, the systems are still not fully understood and it is not always known which silvicultural techniques are most appropriate in which situations, nor how decisions about forest management activities interact with other natural and human-derived threats. Whereas in the Mississippi Alluvial Valley, the demand for forest products can promote silviculture that does not achieve forest conditions desired for biodiversity and ecological function (i.e., size, structure and composition of forest vegetation, availability of dead and down woody debris). There is some evidence (and research is ongoing) that the size and location of openings, which species are retained, harvest method (equipment and techniques), past disturbance of hydrology and availability of red maple/sweet gum seed in the surrounding landscape all can have an impact on successful development of stands with the desired species composition and habitat elements. Silviculture decisions should emphasize the geomorphic setting and hydrologic conditions of the site, while restoring or maintaining the species and structural diversity. [Sources: 144, Experts: Amanda Mahaffey, Mike Aust, Jeff Marcus, Mike Schafale]

The above discussion of threats is generalized to all Bottomland Hardwoods; however, the same threats apply to the subset of these forests which has been identified as HCV 3 – Late Successional Bottomland Hardwoods.

Risk Designation: Specified Risk for the extent of the Bottomlands Hardwood distribution that occurs within the portions of the Southeast and Mississippi Alluvial Valley regions that are also within the USFS Outer Coastal Plain Mixed Forest and Lower Mississippi Riverine Forest Ecological Subregions (USFS Ecological Subregions of the USA⁴⁶) and that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in the PAD-US⁴⁷ dataset and USFS Inventoried Roadless Areas⁴⁸).

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⁴⁶ <https://databasin.org/datasets/662c543156c14313b87d9b99b7a78221>

⁴⁷ <https://gapanalysis.usgs.gov/padus/data/download/>

⁴⁸ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

143. Ober, Holly K. The Importance of Bottomland Hardwood for Wildlife. University of Florida IFAS Extension. Retrieved from <http://edis.ifas.ufl.edu/pdf/UW/UW31600.pdf>
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Experts Consulted:

- Amanda Mahaffey, Forest Stewards Guild
- Mike Aust, Virginia Tech, Forest Resources & Environmental Conservation
- David Stahle, University of Arkansas
- Jeff Marcus, The Nature Conservancy
- Bob Kellison, Professor Emeritus, North Carolina State University
- Michael Schafale, North Carolina Natural Heritage Program

Native Longleaf Pine Systems

FSC Region: Southeast

Description: Once one of the most widespread forest types in the US, longleaf pine savannah has been reduced to less than 5% of its original range. In terms of proportion of original extent that remains, this makes this system one of the rarest in the world. While there has been recent success in increasing the extent of longleaf pine, it is still only a tiny fraction of its historical extent and thus continues to be considered rare. They are associated with particularly high animal and plant diversity, including nearly 900 endemic plant species and rare wildlife such as the Red-cockaded Woodpecker, Bachman's Sparrow, Henslow's Sparrow, Eastern Harvest Mouse, Gopher Tortoise, Wolf spider, Eastern Indigo Snake, and Flatwoods Salamander. Twenty-nine federally listed species are associated with longleaf pine systems and their historic decline. [Sources: 40,146,150,246]

Characteristics of these fire-dependent systems include longleaf pine as the dominant tree, a conspicuous lack of mid-story trees and shrubs, and a well-developed, diverse ground layer (dominated by bunch grasses and other flowering plants). Longleaf Pine systems can be sub-categorized into four basic groups: Montane, Sandhill, Rolling Hill, and Flatwoods & Savanna [Sources: 40,147]. At a landscape scale, naturally occurring longleaf systems typically exist as an uneven-aged mosaic of even-aged patches, which vary in size, shape, structure, composition and density depending upon the local conditions. This variability helps to drive the high biodiversity associated with them, with most of that biodiversity in the ground layer. Fire is the most important driver in the system, maintaining both the structural characteristics and the species diversity, particularly in the ground layer. [Sources: 40,145,147,148,150].

Longleaf pine is responsible in part for the high biodiversity associated with the Southern Appalachian, Florida Panhandle, Central Florida, and Cape Fear Arch Critical Biodiversity Areas.

“Native” in this instance refers to existing 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 definition. “Native” does not imply a particular regeneration method; these stands may be either planted or naturally regenerated.

This forest type can be defined using NatureServe’s Ecological Classification Standard⁴⁹ for the following ecological systems:

- Southeastern Interior Longleaf Pine Woodland (CES 202.319)
- East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland (CES 203.496)
- East Gulf Coastal Plain Near-Coast Pine Flatwood (CES 203.375)
- Central Florida Pine Flatwood (CES 203.832)
- Southern Atlantic Coastal Plain Wet Pine Savanna & Flatwood (CES 203.536)
- Florida Longleaf Pine Sandhill (CES 203.284)
- West Gulf Coastal Plain Wet Longleaf Pine Savanna & Flatwood (CES 203.191)

Indication of Risk: Threats include altered stand structure (due to lack of fire), conversion to other forest types, conversion to other land uses (development and agriculture), habitat disturbance, fragmentation, and modification of hydrological features threaten native longleaf pine systems. As a fiber-producing forest type, long-leaf cannot compete with loblolly or slash pine for short-term returns on investment. As a result, native longleaf is still being converted to other forest types [Sources: 145,147,148,149,150, Experts: Troy Ettel, Carl Nordman], and while these other forest types may provide an acceptable habitat for some species, their establishment is threatening the existing longleaf pine areas. The hydrology of a site is important for both establishment of longleaf pine systems, but also for the natural function of the wetlands (ephemeral and permanent) that typically occur within them. The hydrology of a site can be affected by both past and current silvicultural practices. [Sources: 247,248]

Biodiversity values can be adversely affected by forest management activities via conversion of longleaf to other pine types, and the use of management techniques, including herbicide application that have the potential to inhibit native understory communities. [Expert: Troy Ettel] As the bulk of the biodiversity exists in the understory of a longleaf pine system, restoration or maintenance of species composition is an essential component of longleaf pine conservation. While herbicides can be an essential tool in restoration of longleaf pine, there is mixed evidence regarding the impact of herbicides on understory vegetation – different chemicals and application methods may have differing affects. [Sources: 225,226]

Threats are different in different places, with lack of fire being the overall greatest concern, followed by conversion to other land uses (development) and incompatible forest management practices (conversion to other forest types). However, the interactions between these three threats compound the problems - it is much more difficult to implement fire as a management tool when near urban areas, and fire is suppressed in the typical management of loblolly or slash pine, so that even the ground layer plant diversity is lost. [Expert: Troy Ettel] It is possible to harvest in and sustainably manage longleaf pine systems [Source: 227, Expert: Troy Ettel] and therefore timber management by itself is not considered a threat.

⁴⁹ NatureServe. 2009. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 06 February 2009. (http://downloads.natureserve.org/get_data/data_sets/veg_data/nsDescriptions.pdf)

Risk Designation: Specified Risk for counties that are identified in Figure 1 of the Range-wide Longleaf Conservation Plan as having 10,000 or more acres of Longleaf Pine [Source: 146, p.32] and that are not effectively protected (as demonstrated by GAP Status 1 & 2 areas in the PAD-US⁵⁰ dataset and USFS Inventoried Roadless Areas⁵¹).

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⁵⁰ <https://gapanalysis.usgs.gov/padus/data/download/>

⁵¹ <https://www.fs.usda.gov/detail/roadless/2001roadlessrule/maps/?cid=stelprdb5382437>

226. The Longleaf Alliance. Herbicides. Retrieved from
<https://www.longleafalliance.org/what-we-do/restoration-management/herbicides>

Experts Consulted:

- Troy Ettel, The Nature Conservancy
- Carl Nordman, NatureServe

HCV 4 – Critical Ecosystem Services

HCV 4 Definitions:

FSC-PRO-60-002a (NRA Framework): “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 Forest Management Standard: “HCV forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control).” Examples include situations where all or part of the forest is critical for providing a source of community drinking water, for protecting community drinking water supplies, for mediating flooding or controlling stream flow regulation and water quality, or for controlling erosion, landslides or avalanches that would threaten local communities.

Common Guidance for the Identification of HCV⁵² - HCV 4:

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.

Given the above definitions and guidance, the following assessment of HCV 4 focuses on forests that protect drinking water and water quality as ecosystems services for local communities.

For the purposes of this risk assessment, the following thought process is applied:

5. Are HCV 4 present? – If no, the area is designated ‘Low Risk.’ If yes, go to #2.
6. Is the HCV 4 threatened by forest management activities? – If no, the area is designated ‘Low Risk.’ If yes, the area is designated ‘Specified Risk.’

Risk Assessment for HCV 4:

Data Used for HCV Identification:

The only dataset that the NRA WG found for the HCV4 assessment was the USFS Forests to Faucets Dataset⁵³ (Surface Drink Water Importance Index, Index of Forest Importance to Surface Drinking Water). This dataset 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. The NRA WG concluded that this datalayer shows the importance of watersheds in the US to drinking water provision, and

⁵² 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

⁵³ https://www.fs.fed.us/ecosystemservices/FS_Efforts/forests2faucets.shtml

therefore the existence of HCV 4 associated with drinking water throughout much of the assessment area, particularly in the Eastern US and along the Pacific Coast.

While HCV 4 includes much more than just drinking water (as indicated in the definitions and guidance above), there are not datasets available for consistent identification of all HCV 4 throughout the assessment area. Therefore, the following risk assessment will consider the entire assessment area to have potential for occurrence of HCV 4.

Description: The importance of well managed forests for HCV 4 (i.e., drinking water, watershed protection, erosion control, landslides, etc.) has been well documented. For example, studies have indicated that the cost of water purification for populated areas is lower when the forests within the source watershed are well managed [Source: 156]. Conversely, when forest management is not implemented well in HCV 4 areas, the effects can typically be seen through increased sediment and/or other pollutants in the water, affecting overall water quality along with impacts to the other critical ecosystem services that these forested areas provide. Therefore, the following assessment of whether HCV 4 are threatened by forest management activities and/or whether they are effectively protected, focuses on forestry best management practices (BMPs) developed for compliance with federal regulations governing Non-Point Source pollution of US waters as a proxy for forest management practices that effectively protect HCV 4.

Indication of Risk: The Clean Water Act (CWA), which is enforced by the US Environmental Protection Agency (EPA) establishes the basic structure for regulating discharges of pollutants (including sediment) into the waters of the United States and regulating quality standards for surface waters. Overall, EPA monitoring indicates that contaminants are very rarely associated with forest management activities - of all of the different sources of pollution and contaminants listed by the EPA, forest management is at the very bottom of the list. However, it can still be a contributor. [Sources: 152,153,155,156].

Every state in the US has developed a set of forestry BMPs – some as early as the 1970s. BMPs are recognized by the CWA as being the best way to address nonpoint source pollution from land management activities, even though they do vary somewhat from state-to-state. However, in terms of HCV 4, states typically include BMPs that address wetlands (which would most likely include HCV 4 for flooding), steep slopes (which would most likely include HCV 4 for landslides and erosion control), and buffer zones adjacent to streams (which would most likely include HCV 4 for erosion control). [Sources: 154,158] Therefore, if BMPs effectively protect these kinds of areas from degradation (and resulting water quality effects), it would be possible to conclude that they would also effectively protect HCV 4.

All states with substantial levels of timber harvest have invested in nonpoint source pollution programs that are based on BMPs. Peer reviewed research has found that when forestry BMPs are implemented, they protect water quality [Source: 158,249]. Indicator 4.19 of the National Report on Sustainable Forests indicates that the area and percent of forest land with significant soil degradation is low, suggesting that implemented BMPs are effective [Source: 157]. Other research, though somewhat limited, supports this conclusion [Source: 250,252,253], with recognition that the level of effectiveness may vary some with the varying specifications of BMPs [Source: 251].

Those states that have invested in BMP monitoring programs generally report high levels of compliance and/or few significant risks to water quality [Source: 154]. Following a survey that requested results of state monitoring of BMPs, the National Association of State Foresters estimated that implementation rates average 91% nationwide [Source: 156,158]. Additionally, evidence indicates that those implementation rates are increasing over time [Source: 158,249]. Effectiveness of BMPs is also likely increasing with time, as they receive periodic review and revision [Source: 249].

Management practices that threaten HCV 4 (as defined by the FSC US HCV Framework) would result in increased sediment and/or other pollutants in affected waters. Conversely, forest management practices that do not threaten water quality will also effectively maintain the provision of other ecosystem services by those same forests. Evidence of the effectiveness of forestry BMPs, combined with the reported levels of compliance, indicates that there is a high likelihood that HCV 4 are not being threatened by forest management practices throughout the assessment area due to the implementation of forestry BMPs associated with State nonpoint source pollution programs for compliance with the federal Clean Water Act.

Risk Designation: Low Risk for the entire assessment area

Sources of Information:

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HCV 5 – Community Needs

HCV 5 Definitions:

FSC-PRO-60-002a (NRA Framework): “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 Forest Management Standard: “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.

Common Guidance for the Identification of HCV⁵⁴ - HCV 5:

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

Given the above definitions and guidance, the following assessment of HCV 5 focuses on forests that provide tangible materials for the physical needs of the people that depend upon them and have no alternative, with an emphasis on areas where the dependence is

⁵⁴ 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

associated with whole communities or significant portions of communities of indigenous or non-indigenous peoples.

For the purposes of this risk assessment, the following thought process is applied:

- 7. Are HCV 5 present? – If no, the area is designated 'Low Risk.' If yes, go to #2.*
- 8. Is the HCV 4 threatened by forest management activities? – If no, the area is designated 'Low Risk.' If yes, the area is designated 'Specified Risk.'*

Risk Assessment for HCV 5:

Data Used for HCV Identification:

No evidence of HCV 5 related to non-tribal communities in the conterminous United States was found through a literature search on this topic. There is some evidence that they may occur in Alaska and Hawaii [Sources: 160, 5], but these states are not included in the assessment area for the NRA. FSC US also surveyed US certification bodies with forest management clients to inquire if they have received any comments from communities or stakeholders that depend on forests for their livelihood during forest management public consultations – the response was negative from all surveyed certification bodies [Source: 159]. There is no reason to believe that HCV 5 would be more or less likely to occur on certified vs noncertified lands (the focus of the NRA), therefore, our survey of certification bodies provides a sampling of lands throughout the assessment area.

FSC US staff consulted with two FSC-certified tribes, two forest managers with extensive experience working with Tribes, and a representative of an affiliation of tribes.

Description: Limited subsistence activities by individuals from non-tribal communities are believed to occur in the conterminous United States, but the question is really whether these activities meet the above definitions for HCV 5. The US Forest Service has broadened its consideration of subsistence to include and emphasize both social and cultural subsistence [Sources: 160, 5] and other assessments of 'subsistence' use of Non-Timber Forest Products focus on how these products are sold and/or traded and become part of a market system on which people depend [Source: 5, 162]. Neither of these is consistent with the HCV 5 definition above. It is important to note that HCV 5 does not include forest uses such as recreational hunting or commercial timber harvesting. In rural areas in heavily forested environments, there is evidence of subsistence need at the scale of the individual, but not whole communities, or significant portions of communities [Source: 5].

Federal treaties exist for lands within the assessment area that protect the rights of American Indians to hunt, fish, trap and gather on reservations and on treaty-specified lands off reservations. [Source: 160] While in many instances these activities do not constitute situations where all or a significant portion of the tribe is dependent upon the forest resources for basic subsistence related to food and firewood, in some instances they are essential for these purposes due to the poverty level within some tribes and lack of retirement income. Additionally, tribes that live within forested environments frequently gather materials from the forest that are essential for cultural or traditional activities or for medicinal use. Without these materials, the tribes would not be able to perform the activities and as a result, the culture and community well-being would suffer. It is important to note that these hunting and gathering rights are protected and conducted on either tribally owned land or on lands with specific and enforced treaty rights (i.e. National Forest). [Experts: Marshall Pecore, Marc Gauthier, Jeff Lindsey, Paul Koll, Karen Brenner]

As there are Native American communities throughout the forested portions of the United States that may be dependent upon places within the forest for basic necessities as described above, the following risk assessment considers the entire assessment area.

Indication of Risk: The United States is an industrialized nation that likely does not contain non-tribal communities within the conterminous states that directly rely on sites or resources fundamental to satisfying basic needs. Though subsistence activities by individuals from non-tribal communities likely do occur in the conterminous United States, evidence suggests that they do not meet the definition of HCV 5 and therefore it can be concluded that HCV 5 related to non-tribal communities are unlikely to occur in the assessment area.

In its consultations with experts, FSC US staff heard concern expressed by the representative of the affiliation of tribes regarding localized forest management activities on ancestral lands to which the tribe in question does not have legal rights. However, the certified tribe that responded regarding the risk designation and the forest managers supported a low risk designation, recognizing that there may be isolated and infrequent events, but that there is not a widespread threat to forests on which the tribes are dependent for materials used in cultural and traditional activities (which represent basic needs for tribal communities). [Experts: Marc Gauthier, Jeff Lindsey, Paul Koll, Karen Brenner]

Risk Designation: Low Risk for the entire assessment area

Sources of Information:

159. Certification Bodies Consulted: Kara Wires, Rainforest Alliance; Jim Colla, Bureau Veritas; Brendan Grady, SCS Global Services
160. Emery, Marla R. Interrupting the telos: locating subsistence in contemporary US forests. U.S. Forest Service. 2005. Retrieved from https://www.fs.fed.us/ne/newtown_square/publications/other_publishers/OCR/ne_2005_emery001.pdf
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162. Alexander, Susan J. and Emery, M. Non-Timber Forest Products in the United States: Harvest and Issues. A paper submitted to the XII World Forestry Congress. Retrieved from <http://www.fao.org/docrep/ARTICLE/WFC/XII/0337-A1.HTM>

Experts Consulted:

- Marshall Pecore, Menominee Tribal Enterprises
- Marc Gauthier, Upper Columbia United Tribes
- Jeff Lindsey, Hoopa Valley Tribal Council
- Paul Koll, Forest Manager
- Karen Brenner, Consulting Forester

HCV 6 – Cultural Values

HCV 6 Definitions:

FSC-PRO-60-002a (NRA Framework): “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 Forest Management Standard: “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.

Common Guidance for the Identification of HCV⁵⁵ - HCV 6:

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.

Given the above definitions and guidance, the following assessment of HCV 6 focuses on forests with cultural values that have global or national significance and indigenous peoples' sacred sites.

For the purposes of this risk assessment, the following thought process is applied:

- 9. Are HCV 6 present? – If no, the area is designated 'Low Risk.' If yes, go to #2.*
- 10. Is the HCV 6 threatened by forest management activities? – If no, the area is designated 'Low Risk.' If yes, the area is designated 'Specified Risk.'*

Risk Assessment for HCV 6:

Data Used for HCV Identification:

HCV 6 associated with cultural values of global or national significance in the US are generally identified through formal protection in National Monuments, National Natural Landscapes, National Parks, or in state or local designations and occur throughout the United States. There are national level and state level registries of sites and they occur throughout the assessment area.

Locations of sites sacred to Native American tribes are not generally publicly available due to tribal requests for confidentiality. However, as there were Native American communities throughout the United States prior to European colonization, these sites most likely occur throughout the assessment area. A large number of sites occur on federally-administered lands [Source: 173], however some do occur on other public lands, such as state-administered lands, and private lands. Therefore, the following risk assessment considers the entire assessment area.

⁵⁵ 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 (<https://ic.fsc.org/en/what-is-fsc-certification/consultations/archive/hcv-common-guidance>)

FSC US staff also consulted with an FSC-certified tribe, two forest managers with extensive experience working with Tribes, and a representative of an affiliation of tribes.

Description: There are numerous UNESCO World Heritage sites in the United States [Source: 163], and additional sites and landscapes of national significance that occur primarily within designated National Monuments, National Parks, National Natural Landmarks, or special designations within other Federally- or State-managed managed lands. The significance of these places to the cultural identity of the United States goes without saying. A suite of laws provide protection for them [Source: 168]:

- Antiquities Act of 1906
- National Historic Preservation Act of 1966
- National Environmental Policy Act of 1969
- American Indian Religious Freedom Act of 1978
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Executive Order 13007 of 1996
- Executive Order 13084 of 1998
- State Preservation Laws

Native American tribes lost control over many of their sacred sites during European colonization and the movement of tribes to reservations in geographic locations different from those where they had traditionally lived [Source: 170]. Many of these sacred sites occur on Federally-administered lands. There has been a history of conflict with the Federal Government over protection of these sites. [Source: 165,171,172]

In more recent years, there have been positive changes in this relationship. In 2005, there was an active Sacred Lands Task force appointed by the Forest Service to develop recommendations to strengthen Forest Service procedures pertaining to sacred sites on National Forest lands [Source: 165]. In 2010, US Secretary of Agriculture directed the Office of Tribal Relations and Forest Service to engage in dialogue with Native American tribal leaders to identify ways to better protect sacred sites [Source: 166]. In 2012, a large number of federal agencies entered into a Memorandum of Understanding (MOU) regarding interagency coordination and collaboration for the protection of Indian sacred sites [Source 164]. An action plan for implementation of the MOU was released in 2013 and a progress report detailing accomplishments was released in 2014 [Source: 173]. Also in 2014, the National Congress of American Indians passed a resolution recognizing that MOU and also recognizing that there is still more work to do to implement it [Source: 164]. And in 2016, the US Department of Agriculture committed to enhanced interagency coordination and collaboration and extended the previously signed MOU [Source: 167]. In parallel, new collaborative partnerships are being formed and have been successful in placing sacred lands under protection through land conservancies [Source: 169].

All states have state preservation offices and associated laws, many of which are modeled on the National Historic Preservation Act and the National Environmental Policy Act which require state officials to conduct government to government consultations with Native Americans regarding the effects of governmental undertakings and the impact they may have on cultural resources. Many also have additional specific protections for Native American resources and other applicable laws such as burial protection laws and cemetery protection laws. These provide an additional layer of protections, particularly for sites not on federal lands [Sources: 168,186]

Native American burial sites and sacred objects are given protection on all lands, public or private by the Native American Graves Act of 1990. [Source: 187]

FSC US staff surveyed US certification bodies with forest management clients to inquire if they have received any comments from communities or stakeholders (other than Indigenous

Peoples) that depend on forests for cultural values during forest management public consultations – the response was negative from all surveyed certification bodies [Source: 159]. There is no reason to believe that HCV 6 would be more or less likely to occur on certified vs noncertified lands (the focus of the NRA), therefore, our survey of certification bodies provides a sampling of lands throughout the assessment area.

Indication of Risk: In the United States, globally and nationally significant cultural sites that occur in forested areas are permanently protected as National Monuments, National Natural Landmarks or Parks, thus effectively protecting these cultural values. Many of the Native American tribes' sacred sites occur on federally-managed lands and recent changes in federal policy and action are improving protection of federal lands [Source: 164, 165, 166, 167, 169, 170, 173]. Additional legislative protections also exist at a state scale [Sources: 7,13]. Our survey of certification bodies did not identify any evidence of threats from forest management activities to cultural values critical for local communities in a sampling of state-administered and private lands [Source 159].

FSC US staff conducted an extensive search of articles and information (including hundreds of news articles, press releases, law reviews, and congressional hearings) related to tribal disputes within the last 15 years over sacred sites and sacred places [e.g., Sources 188, 189, 190, 191, 192]. Only three disputes related to forest management activities were identified and in all cases, the courts ruled in favor of the tribes and protection of the sacred sites [Sources: 193, 194, 195]. The remainder dealt with issues primarily related to oil, gas and mineral extraction, development, and recreation.

In its consultations with experts, FSC US staff heard concern expressed by the representative of the affiliation of tribes regarding localized forest management activities on ancestral lands to which the tribe in question does not have legal rights. However, the certified tribe and the forest managers supported a low risk designation, recognizing that there may be isolated and infrequent events, but that there is not a widespread threat to tribal cultural and sacred sites. [Experts: Marc Gauthier, Jeff Lindsey, Paul Koll, Karen Brenner]

Risk Designation: Low Risk for the entire assessment area

Sources of Information:

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Experts Consulted:

- Marc Gauthier, Upper Columbia United Tribes
- Jeff Lindsey, Hoopa Valley Tribal Council
- Paul Koll, Forest Manager
- Karen Brenner, Consulting Forester

Category 3 Control Measures

If an organization wishes to source from a specified risk area, addressing the specified risk through implementation of the following Control Measure is mandatory (CM 3.1). If an organization finds that this control measure is inadequate to mitigate risk found in its specific operations, and the conditions established by Clause 4.13 of the Controlled Wood standard (FSC-STD-40-005 V3-1) apply, the organization may replace the following mandatory control measure with more effective control measures.

CM 3.1: The organization is required to implement both parts of this Control Measures (CM 3.1.a and CM 3.1.b)

CM 3.1.a: The Organization implements either CM 3.1.a.i or CM 3.1.a.ii) for FSC US Regions relevant to the Organization's supply area:

CM 3.1.a.i: A representative of the Organization attends FSC US-coordinated Controlled Wood Regional Meetings when they occur. The meetings will include the following elements:

- Collaborative dialogues including both certificate holders and stakeholders that result in identification of a focused set of actions for each specified risk issue in the region that if implemented by certificate holders will reduce the risk of sourcing materials from lands where the HCV(s) is being threatened by forest management activities and that, when appropriate, includes a range in the level of resource investment required for implementation
- Sharing information, as requested by FSC US, to augment effectiveness verification of actions implemented as part of CM 3.1.b.

NOTE: It is recognized that depending on the information requested, it may not be possible to share it at the Controlled Wood Regional Meeting, and in this situation the Organization shall share it as soon as possible following the meeting.

NOTE: It is the intention of FSC US to strive for very diverse participation in the Controlled Wood Regional Meetings, including certificate holders, environmental organizations, social organizations, experts, academics, public agencies, and landowners who are not certificate holders.

NOTE: If the collaborative dialogues do not successfully identify a focused set of mitigation actions for each specified risk issue, FSC US will implement a contingency plan as detailed below.

NOTE: Following each Controlled Wood Regional Meeting, FSC US will produce a Report that includes: 1) A summary of information communicated in advance of, or at the meetings, regarding identified

specified risk issues; 2) The outcomes of the collaborative dialogues; and 3) Details of information that has been requested of certificate holders to augment effectiveness verification.

NOTE: The FSC US Board of Directors will review the outcomes of the Controlled Wood Regional Meeting collaborative dialogues (or contingency plan) for any significant risks to the system. It is the Board's intention to endorse these outcomes unless a risk is identified, in which case the Board will approve a revised set of actions that will be published in the Report with rationale for any changes.

Compliance Verification: The Organization demonstrates to their certification body that a representative of the Organization attended the meeting(s) held for the region(s) in which the Organization sources materials and the Organization shared the requested information.

CM 3.1.a.ii: The Organization reviews the Controlled Wood Regional Meeting Report(s) and associated information and provides the information requested in the Report.

Compliance Verification: The Organization demonstrates to their certification body an awareness of all three elements of the Controlled Wood Regional Meeting Report and that the requested information was shared.

CM 3.1.b: For each area of specified risk from which the Organization sources materials, the Organization implements one or more of the actions identified during the collaborative dialogue at the Controlled Wood Regional Meeting, as detailed in the Controlled Wood Regional Meeting Report. When options for action with differential levels of resource investment required for implementation are identified, the action(s) implemented shall be commensurate with the scale and intensity of the Organization's potential impact on the HCV.

NOTE: The scale and intensity of the Organization's potential impact on the HCV will be informed by: 1) the volume of materials that are being sourced by the Organization from the specified risk area, 2) the spatial extent of the specified risk area from which the Organization is sourcing materials, and 3) the potential for harm caused by the forest management activities typically required to produce the type of materials sourced from the specified risk area by the Organization.

Compliance Verification: The Organization demonstrates when and how the action(s) identified was implemented and why that action(s) was selected.

Effectiveness Verification for Control Measure CM 3.1:

The Organization shall provide input into the effectiveness verification process through its implementation of CM 3.1.b. An assessment of the effectiveness of actions implemented in reducing the risk of sourcing from lands where HCV are harmed by forest management activities shall be determined by FSC US, in consultation with stakeholders, by evaluating the outcomes from each of the three elements of the Controlled Wood Regional Meetings and comparing them with outcomes from previous meetings, in combination with other monitoring data shared by stakeholders. The results of this assessment will be incorporated into the Controlled Wood Regional Meeting Report and will be used to inform future revisions to the National Risk Assessment.

NOTE: While effectiveness verification will be linked to the Controlled Wood Regional Meetings, which are expected to occur every 3 to 5 years, the Organization is still responsible for reviewing its Due Diligence System at least annually (as specified in FSC-STD-40-005 V3-1, Clause 1.6) to determine if any new information is available that would indicate revisions to the Organization's Due Diligence System are needed.

Contingency Plan for CM 3.1.a

In the event that the Controlled Wood Regional Meeting collaborative dialogues do not come to a successful resolution, the following will be implemented in sequential order until a resolution has been achieved.

1. A small group of certificate holder and stakeholder representatives from the region is formed to build on the information and perspectives shared during the dialogue at the regional meeting. The participants in the group are identified at the regional meeting at the point when it is apparent that it will not be possible find agreement on a set of mitigation actions by the end of the meeting. The participants must have demonstrated an ability to represent the perspective of the chamber with which they are most aligned, an ability to be open to other perspectives and new ideas and an ability to compromise. This group will be asked to complete the process within a short timeframe.
2. If the small group participants are not successfully identified at the regional meeting, FSC US will solicit participants representing a diversity of perspectives and formalize a group in consultation with the FSC US Board of Directors. (with the same constraints on participation as detailed above). Similar to #1 above, this group will be asked to build on the dialogue held at the regional meeting and develop a set of mitigation actions.
3. If the small group in #1 or #2 above is unable to find agreement on a set of mitigation actions within 6 weeks of the Controlled Wood Regional Meeting, FSC US Staff will build on the dialogue held at the regional meeting and the discussions of the small group, and develop a draft set of mitigation actions to be approved by the FSC US Board of Directors prior to being published in the regional meeting report.

Annex F G1-S1/S2 Species for HCV 1 Assessment

This annex lists all of the species that met the initial criteria for consideration in the HCV 1 individual species assessment (see Annex E for assessment methodology). The following species are all G1 (critically imperiled at a global scale) and S1 (critically imperiled at a state scale) in at least one state or G1 and S2 (imperiled at a state scale) in at least one state, based upon a data search completed through NatureServe's Explorer.

| Name | | Taxonomy | | Conservation Status | | | Distribution |
|---------------------------|-----------------------------------|-----------------------|----------------------|----------------------------|------------------------------------|----------------------------|---------------------------|
| Common Name | Scientific Name | Species Group (Broad) | Species Group (Fine) | Nature-Serve Global Status | U.S. Endangered Species Act Status | IUCN Red List Status | Country: States/Provinces |
| Austin Blind Salamander | <i>Eurycea waterlooensis</i> | Amphibians | Salamanders | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| Barton Springs Salamander | <i>Eurycea sosorum</i> | Amphibians | Salamanders | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| Berry Cave Salamander | <i>Gyrinophilus gulolineatus</i> | Amphibians | Salamanders | G1Q | C: Candidate | EN - Endangered | US: TN |
| Black-spotted Newt | <i>Notophthalmus meridionalis</i> | Amphibians | Salamanders | G1 | | EN - Endangered | US: TX |
| Black Toad | <i>Anaxyrus exsul</i> | Amphibians | Frogs and Toads | G1Q | | VU - Vulnerable | US: CA |
| Blanco Blind Salamander | <i>Eurycea robusta</i> | Amphibians | Salamanders | G1Q | | DD - Data deficient | US: TX |
| Cheoah Bald Salamander | <i>Plethodon cheoah</i> | Amphibians | Salamanders | G1G2 | | VU - Vulnerable | US: NC |
| Comal Blind Salamander | <i>Eurycea tridentifera</i> | Amphibians | Salamanders | G1 | | VU - Vulnerable | US: TX |
| Comal Springs Salamander | <i>Eurycea sp. 8</i> | Amphibians | Salamanders | G1Q | | | US: TX |
| Dolan Falls Salamander | <i>Eurycea sp. 10</i> | Amphibians | Salamanders | G1Q | | | US: TX |
| Dusky Gopher Frog | <i>Lithobates sevosus</i> | Amphibians | Frogs and Toads | G1 | LE: Listed endangered | CR - Critically endangered | US: AL, LA, MS |
| Georgetown Salamander | <i>Eurycea naufragia</i> | Amphibians | Salamanders | G1 | LT: Listed threatened | EN - Endangered | US: TX |

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|-------------------------------------|------------------------------|------------|-----------------|------|-----------------------|---------------------|-----------------------------|
| Houston Toad | <i>Anaxyrus houstonensis</i> | Amphibians | Frogs and Toads | G1 | LE: Listed endangered | EN - Endangered | US: TX |
| Jollyville Plateau Salamander | <i>Eurycea tonkawae</i> | Amphibians | Salamanders | G1 | LT: Listed threatened | EN - Endangered | US: TX |
| Lesser Slender Salamander | <i>Batrachoseps minor</i> | Amphibians | Salamanders | G1G2 | | DD - Data deficient | US: CA |
| Patch-nosed Salamander | <i>Urspelepes brucei</i> | Amphibians | Salamanders | G1 | | LC - Least concern | US: GA |
| Pedernales River Springs Salamander | <i>Eurycea sp. 6</i> | Amphibians | Salamanders | G1 | | | US: TX |
| Relict Leopard Frog | <i>Lithobates onca</i> | Amphibians | Frogs and Toads | G1G2 | C: Candidate | EN - Endangered | US: AZ, NV, UT (extirpated) |
| Relictual Slender Salamander | <i>Batrachoseps relictus</i> | Amphibians | Salamanders | G1 | | DD - Data deficient | US: CA |
| Salado Salamander | <i>Eurycea chisholmensis</i> | Amphibians | Salamanders | G1 | LT: Listed threatened | VU - Vulnerable | US: TX |
| San Marcos Salamander | <i>Eurycea nana</i> | Amphibians | Salamanders | G1 | LT: Listed threatened | VU - Vulnerable | US: TX |
| Scott Bar Salamander | <i>Plethodon asupak</i> | Amphibians | Salamanders | G1G2 | | VU - Vulnerable | US: CA |
| Texas Salamander | <i>Eurycea neotenes</i> | Amphibians | Salamanders | G1 | | VU - Vulnerable | US: TX |
| Giant Kanagaroo Rat | <i>Dipodomys ingens</i> | Mammal | Rodents | G1G2 | LE: Listed endangered | EN - Endangered | US: CA |
| Buck Darter | <i>Etheostoma nebra</i> | Fishes | Bony Fishes | G1 | | | US: KY |
| California Clapper Rail | <i>Railus obsoletus</i> | Birds | Other Birds | G1 | LE: Listed endangered | | US: AZ, CA, NV, NM, TX |
| Tricolored Blackbird | <i>Agelaius tricolor</i> | Birds | Perching Birds | G1G2 | | EN - Endangered | US: CA, NV, OR |
| Shenandoah Salamander | <i>Plethodon shenandoah</i> | Amphibians | Salamanders | G1 | LE: Listed endangered | VU - Vulnerable | US: VA |
| Sierra Buttes Salamander | <i>Hydromantes sp. 3</i> | Amphibians | Salamanders | G1Q | | | US: CA |

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|---|----------------------------------|------------|-----------------|----|---|----------------------------|---|
| Southern Mountain Yellow-legged Frog | <i>Rana muscosa</i> | Amphibians | Frogs and Toads | G1 | LE: Listed endangered | EN - Endangered | US: CA |
| Texas Blind Salamander | <i>Eurycea rathbuni</i> | Amphibians | Salamanders | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| West Virginia Spring Salamander | <i>Gyrinophilus subterraneus</i> | Amphibians | Salamanders | G1 | | EN - Endangered | US: WV |
| Wyoming Toad | <i>Anaxyrus baxteri</i> | Amphibians | Frogs and Toads | G1 | LE: Listed endangered | EW - Extinct in the wild | US: WY |
| Black-capped Petrel | <i>Pterodroma hasitata</i> | Birds | Other Birds | G1 | | EN - Endangered | US: FL, GA, NC |
| California Condor | <i>Gymnogyps californianus</i> | Birds | Other Birds | G1 | | CR - Critically endangered | US: AZ, AZ (extirpated), CA, OR (extirpated), WA (extirpated) |
| Island Scrub-jay | <i>Aphelocoma insularis</i> | Birds | Perching Birds | G1 | | VU - Vulnerable | US: CA |
| Ivory-billed Woodpecker | <i>Campephilus principalis</i> | Birds | Other Birds | G1 | LE: Listed endangered | CR - Critically endangered | US: AL (extirpated), AR, FL, GA (extirpated), IL (extirpated), KY (extirpated), LA (extirpated), MD (extirpated), MO (extirpated), MS (extirpated), NC (extirpated), OH (extirpated), OK (extirpated), SC (extirpated), TN (extirpated), TX (extirpated) |
| Short-tailed Albatross | <i>Phoebastria albatrus</i> | Birds | Other Birds | G1 | LE: Listed endangered | VU - Vulnerable | US: AK, CA, HI, WA CA: BC |
| Whooping Crane | <i>Grus americana</i> | Birds | Wading Birds | G1 | LE, XN: Listed endangered, nonessential experimental population | EN - Endangered | US: AR (extirpated), FL, GA, IA (extirpated), ID (extirpated), IL (extirpated), KS, KY (extirpated), LA, MN (extirpated), MT, ND (extirpated), NE, OK, SD, TN (extirpated), TX, UT (extirpated), WI (extirpated), WI CA: AB, MB (extirpated), MB, NT, NU (extirpated), ON, SK (extirpated), SK |
| Alabama Cavefish | <i>Speoplatyrhinus poulsoni</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: AL |
| Alabama Sturgeon | <i>Scaphirhynchus suttkusi</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: AL, MS |

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|--|---------------------------------------|--------|-------------|-------|---|----------------------------|--|
| Amber Darter | <i>Percina antesella</i> | Fishes | Bony Fishes | G1G2 | LE: Listed endangered | EN - Endangered | US: GA, TN |
| Banded Killifish - Lake Phelps Population | <i>Fundulus cf. diaphanus</i> | Fishes | Bony Fishes | G1Q | | | US: NC |
| Bankhead Darter | <i>Percina sipsi</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: AL |
| Barrens Darter | <i>Etheostoma forbesi</i> | Fishes | Bony Fishes | G1G2 | | VU - Vulnerable | US: TN |
| Barrens Topminnow | <i>Fundulus julisia</i> | Fishes | Bony Fishes | G1 | | EN - Endangered | US: TN |
| Bayou Darter | <i>Etheostoma rubrum</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | EN - Endangered | US: MS |
| Bear Lake Whitefish | <i>Prosopium abyssicola</i> | Fishes | Bony Fishes | G1 | | | US: ID, UT |
| Big Bend Gambusia | <i>Gambusia gaigei</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| Blueface Darter | <i>Etheostoma sp. 14</i> | Fishes | Bony Fishes | G1 | | | US: AL |
| Bluemask Darter | <i>Etheostoma akatulo</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: TN |
| Bonytail | <i>Gila elegans</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: AZ, CA, CO (extirpated), NM (extirpated), NN (extirpated), NV, UT, WY (extirpated) |
| Borax Lake Chub | <i>Siphateles boraxobius</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: OR |
| Boulder Darter | <i>Etheostoma wapiti</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | VU - Vulnerable | US: AL, TN |
| Caddo Madtom | <i>Noturus taylori</i> | Fishes | Bony Fishes | G1 | | EN - Endangered | US: AR |
| Cape Fear Shiner | <i>Notropis mekistocholas</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: NC |
| Carolina Redhorse | <i>Moxostoma sp. 3</i> | Fishes | Bony Fishes | G1G2Q | | | US: NC, SC |
| Cheat Minnow | <i>Pararhinichthys bowersi</i> | Fishes | Bony Fishes | G1G2Q | | | US: MD (extirpated), PA, WV |

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|--------------------------|---------------------------------|--------|-------------|------|---|----------------------------|---|
| Chesapeake Logperch | <i>Percina bimaculata</i> | Fishes | Bony Fishes | G1G2 | | VU - Vulnerable | US: MD, PA, VA (extirpated) |
| Chihuahua Catfish | <i>Ictalurus sp. 1</i> | Fishes | Bony Fishes | G1G2 | | | US: NM, TX |
| Chihuahua Chub | <i>Gila nigrescens</i> | Fishes | Bony Fishes | G1G2 | LT: Listed threatened | VU - Vulnerable | US: NM |
| Chunky Madtom | <i>Noturus crypticus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: TN |
| Citico Darter | <i>Etheostoma sitikuense</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: TN |
| Clear Creek Gambusia | <i>Gambusia heterochir</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| Clinch Dace | <i>Chrosomus sp. 1</i> | Fishes | Bony Fishes | G1 | | | US: TN, VA |
| Clinch Sculpin | <i>Cottus sp. 4</i> | Fishes | Bony Fishes | G1G2 | | | US: VA |
| Colorado Pikeminnow | <i>Ptychocheilus lucius</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | VU - Vulnerable | US: AZ, CA (extirpated), CO, NM, NN, NV (extirpated), UT, WY (extirpated) |
| Comanche Springs Pupfish | <i>Cyprinodon elegans</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: TX |
| Conasauga Logperch | <i>Percina jenkinsi</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: GA, TN |
| Cui-ui | <i>Chasmistes cujus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: NV |
| Cumberland Darter | <i>Etheostoma susanae</i> | Fishes | Bony Fishes | G1G2 | LE: Listed endangered | EN - Endangered | US: KY, TN |
| Delta Smelt | <i>Hypomesus transpacificus</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | EN - Endangered | US: CA |
| Desert Dace | <i>Eremichthys acros</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | VU - Vulnerable | US: NV |
| Desert Pupfish | <i>Cyprinodon macularius</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | | US: AZ, CA |
| Devil's Hole Pupfish | <i>Cyprinodon diabolis</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: NV |
| Devils River Minnow | <i>Dionda diaboli</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | EN - Endangered | US: TX |
| Diamond Darter | <i>Crystallaria cincotta</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: KY (extirpated), OH (extirpated), TN (extirpated), WV |

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|---------------------------|---------------------------------|--------|-------------|-------|---|----------------------------|--|
| Duskytail Darter | <i>Etheostoma percnurum</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | | US: VA |
| Egg-mimic Darter | <i>Etheostoma pseudovulatum</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: TN |
| Etowah Chub | <i>Hybopsis sp. 9</i> | Fishes | Bony Fishes | G1Q | | | US: GA |
| Etowah Darter | <i>Etheostoma etowahae</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: GA |
| Fountain Darter | <i>Etheostoma fonticola</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: TX |
| Humpback Chub | <i>Gila cypha</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AZ, CO, NN, NV (extirpated), UT, WY (extirpated) |
| Ives Lake Cisco | <i>Coregonus hubbsi</i> | Fishes | Bony Fishes | G1Q | | | US: MI |
| Kern Brook Lamprey | <i>Entosphenus hubbsi</i> | Fishes | Lampreys | G1G2 | | VU - Vulnerable | US: CA |
| Laurel Dace | <i>Chrosomus saylori</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: TN |
| Leon Springs Pupfish | <i>Cyprinodon bovinus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: TX |
| Little Colorado Spinedace | <i>Lepidomeda vittata</i> | Fishes | Bony Fishes | G1G2 | LT: Listed threatened | VU - Vulnerable | US: AZ |
| Lost River Sucker | <i>Deltistes luxatus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: CA, OR |
| Lower Coosa Darter | <i>Etheostoma sp. 3</i> | Fishes | Bony Fishes | G1G2Q | | | US: AL |
| Marbled Darter | <i>Etheostoma marmorpinnum</i> | Fishes | Bony Fishes | G1 | | | US: TN |
| Moapa Dace | <i>Moapa coriacea</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: NV |
| Nueces Shiner | <i>Cyprinella sp. 2</i> | Fishes | Bony Fishes | G1G2Q | | | US: TX |
| Owens Pupfish | <i>Cyprinodon radiosus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: CA |
| Pahrump Poolfish | <i>Empetrichthys latos</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | | US: NV |
| Palezone Shiner | <i>Notropis albizonatus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AL, KY, TN |

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|----------------------------------|---------------------------------------|--------|-------------|------|---|----------------------------|---|
| Pearl Darter | <i>Percina aurora</i> | Fishes | Bony Fishes | G1 | C: Candidate | EN - Endangered | US: LA, MS |
| Peppered Chub | <i>Macrhybopsis tetranema</i> | Fishes | Bony Fishes | G1 | | EN - Endangered | US: CO (extirpated), KS, NM, OK, TX |
| Plateau Shiner | <i>Cyprinella lepida</i> | Fishes | Bony Fishes | G1G2 | | EN - Endangered | US: TX |
| Pygmy Madtom | <i>Noturus stanauli</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | EN - Endangered | US: TN |
| Pygmy Sculpin | <i>Cottus paulus</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | CR - Critically endangered | US: AL |
| Razorback Sucker | <i>Xyrauchen texanus</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: AZ, CA, CO, NM, NN, NV, UT, WY (extirpated) |
| Relict Darter | <i>Etheostoma chienense</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: KY |
| Rio Grande Silvery Minnow | <i>Hybognathus amarus</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | EN - Endangered | US: NM, TX (extirpated) |
| Roanoke Logperch | <i>Percina rex</i> | Fishes | Bony Fishes | G1G2 | LE: Listed endangered | VU - Vulnerable | US: NC, VA |
| Robust Redhorse | <i>Moxostoma robustum</i> | Fishes | Bony Fishes | G1 | | EN - Endangered | US: GA, NC, SC |
| Rush Darter | <i>Etheostoma phytophilum</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AL |
| Salish Sucker | <i>Catostomus sp. 4</i> | Fishes | Bony Fishes | G1 | | | US: WA CA: BC |
| San Felipe Gambusia | <i>Gambusia clarkhubbsi</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: TX |
| Santa Ana Sucker | <i>Catostomus santaanae</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | VU - Vulnerable | US: CA |
| Shortnose Sucker | <i>Chasmistes brevirostris</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: CA, OR |
| Slackwater Darter | <i>Etheostoma boschungii</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | EN - Endangered | US: AL, TN |

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|----------------------|--------------------------------|--------|-------------|-------|---|----------------------------|----------------|
| Slender Chub | <i>Erimystax cahni</i> | Fishes | Bony Fishes | G1 | LT, XN: Listed threatened, nonessential experimental population | EN - Endangered | US: TN, VA |
| Smoky Madtom | <i>Noturus baileyi</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | VU - Vulnerable | US: TN |
| Sonoyta Pupfish | <i>Cyprinodon eremus</i> | Fishes | Bony Fishes | G1 | | | US: AZ |
| Spring Pygmy Sunfish | <i>Elassoma alabamae</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | | US: AL |
| Striated Darter | <i>Etheostoma striatulum</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: TN |
| Texas Pipefish | <i>Syngnathus affinis</i> | Fishes | Bony Fishes | G1 | | | US: TX |
| Toothless Blindcat | <i>Trogloglanis pattersoni</i> | Fishes | Bony Fishes | G1G2 | | VU - Vulnerable | US: TX |
| Trispot Darter | <i>Etheostoma trisella</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: AL, GA, TN |
| Tuxedo Darter | <i>Etheostoma lemniscatum</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: KY, TN |
| Upper Coosa Darter | <i>Etheostoma sp. 1</i> | Fishes | Bony Fishes | G1G2Q | | | US: AL, GA |
| Vermilion Darter | <i>Etheostoma chermocki</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: AL |
| Virgin River Chub | <i>Gila seminuda</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AZ, NV, UT |
| Waccamaw Darter | <i>Etheostoma perlongum</i> | Fishes | Bony Fishes | G1Q | | VU - Vulnerable | US: NC |
| Waccamaw Killifish | <i>Fundulus waccamensis</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: NC |
| Waccamaw Silverside | <i>Menidia extensa</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | VU - Vulnerable | US: NC |
| Wall Canyon Sucker | <i>Catostomus sp. 1</i> | Fishes | Bony Fishes | G1 | | | US: NV |
| Warner Sucker | <i>Catostomus warnerensis</i> | Fishes | Bony Fishes | G1 | LT: Listed threatened | VU - Vulnerable | US: NV, OR |

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|-----------------------------------|----------------------------------|---------|---------------------|------|---|----------------------------|---|
| Watercress Darter | <i>Etheostoma nuchale</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AL |
| White River Sculpin | <i>Cottus sp. 3</i> | Fishes | Bony Fishes | G1 | | | US: NV |
| White River Spinedace | <i>Lepidomeda albivallis</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | CR - Critically endangered | US: NV |
| White Sands Pupfish | <i>Cyprinodon tularosa</i> | Fishes | Bony Fishes | G1 | | VU - Vulnerable | US: NM |
| Widemouth Blindcat | <i>Satan eurystomus</i> | Fishes | Bony Fishes | G1G2 | | VU - Vulnerable | US: TX |
| Woundfin | <i>Plagopterus argentissimus</i> | Fishes | Bony Fishes | G1 | LE, XN: Listed endangered, nonessential experimental population | CR - Critically endangered | US: AZ, NV, UT |
| Yaqui Chub | <i>Gila purpurea</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | VU - Vulnerable | US: AZ |
| Yellowcheek Darter | <i>Etheostoma moorei</i> | Fishes | Bony Fishes | G1 | LE: Listed endangered | EN - Endangered | US: AR |
| Yellowfin Madtom | <i>Noturus flavipinnis</i> | Fishes | Bony Fishes | G1 | LT, XN: Listed threatened, nonessential experimental population | VU - Vulnerable | US: GA (extirpated), TN, VA |
| Black-footed Ferret | <i>Mustela nigripes</i> | Mammals | Carnivores | G1 | LE, XN: Listed endangered, nonessential experimental population | EN - Endangered | US: AZ, CO, KS, MT, ND, NE, NM, NN (extirpated), OK (extirpated), SD, TX (extirpated), UT, WY CA: AB (extirpated), SK (extirpated) |
| Florida Bonneted Bat | <i>Eumops floridanus</i> | Mammals | Bats | G1 | LE: Listed endangered | CR - Critically endangered | US: FL |
| Guadalupe Fur Seal | <i>Arctocephalus townsendi</i> | Mammals | Carnivores | G1 | LT: Listed threatened | NT - Near threatened | US: CA |
| North Atlantic Right Whale | <i>Eubalaena glacialis</i> | Mammals | Whales and Dolphins | G1 | LE: Listed endangered | EN - Endangered | US: DE (extirpated), DE, FL, GA, MA, MD, ME, NC, NJ, NY, RI, TX CA: LB, NB, NF, NS, PE, QC |

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|------------------------------|------------------------------------|----------|---------------|------|---|----------------------------|--|
| Northern Myotis | <i>Myotis septentrionalis</i> | Mammals | Bats | G1G2 | PE: Proposed endangered | LC - Least concern | US: AL, AR, CT, DC, DE, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MO, MS, NC, ND, NE, NH, NJ, NY, OH, OK, PA, RI, SC, SD, TN, VA, VT, WI, WV, WY, WY CA: AB, BC, LB, MB, MB, NB, NF, NS, NT, ON, PE, QC, SK, SK, YT |
| Red Wolf | <i>Canis rufus</i> | Mammals | Carnivores | G1Q | LE, XN: Listed endangered, nonessential experimental population | CR - Critically endangered | US: AL (extirpated), AR (extirpated), FL (extirpated), GA (extirpated), IL (extirpated), IN (extirpated), KY (extirpated), LA (extirpated), MO (extirpated), MS (extirpated), NC, OK (extirpated), SC, TN (extirpated), TX (extirpated), VA (extirpated) |
| Robust Cottontail | <i>Sylvilagus robustus</i> | Mammals | Other Mammals | G1G2 | | EN - Endangered | US: NM, TX |
| Salt-marsh Harvest Mouse | <i>Reithrodontomys raviventris</i> | Mammals | Rodents | G1G2 | LE: Listed endangered | EN - Endangered | US: CA |
| Sherman's Short-tailed Shrew | <i>Blarina shermani</i> | Mammals | Other Mammals | G1 | | | US: FL |
| Strecker's Pocket Gopher | <i>Geomys streckeri</i> | Mammals | Rodents | G1Q | | | US: TX |
| Arizona Night Lizard | <i>Xantusia arizonae</i> | Reptiles | Lizards | G1G2 | | LC - Least concern | US: AZ |
| Blunt-nosed Leopard Lizard | <i>Gambelia sila</i> | Reptiles | Lizards | G1 | LE: Listed endangered | EN - Endangered | US: CA |
| Coachella Fringe-toed Lizard | <i>Uma inornata</i> | Reptiles | Lizards | G1Q | LT: Listed threatened | EN - Endangered | US: CA |
| Rim Rock Crowned Snake | <i>Tantilla oolitica</i> | Reptiles | Snakes | G1G2 | | EN - Endangered | US: FL |
| Sandstone Night Lizard | <i>Xantusia gracilis</i> | Reptiles | Lizards | G1 | | VU - Vulnerable | US: CA |
| Sierra Night Lizard | <i>Xantusia sierrae</i> | Reptiles | Lizards | G1 | | | US: CA |
| Alabama Red-bellied Cooter | <i>Pseudemys alabamensis</i> | Turtles | | G1 | LE: Listed endangered | EN - Endangered | US: AL, MS |
| Kemp's Ridley Sea Turtle | <i>Lepidochelys kempii</i> | Turtles | | G1 | LE: Listed endangered | CR - Critically endangered | US: AL, CT, DE, FL, GA, LA, MA, MD, ME, MS, NC, NC, NH, NJ, NY, RI, TX, VA |

Annex G Detailed Description of Conversion Risk Designations

This annex is intended to provide the Category 4 assessment in a more accessible format than the required National Risk Assessment template in the main document. Additionally, it includes supplemental details, context and guidance that are not in the main document which are intended to help readers better understand the rationale behind the risk designation decisions for the Category 4 indicator. For any category with an associated annex, the content found in the main body of the risk assessment, not the annex, is definitive.

Category 4 – Conversion

FSC considers materials that come from places where forests (natural or semi-natural) are converted to non-forest use or plantation to be unacceptable materials. Therefore, the NRA assesses the risk of sourcing from these kinds of areas.

Definitions from the FSC-US Forest Management Standard:

Forest: Generally, an ecosystem characterized by tree cover; more particularly, a plant community predominantly of trees and other woody vegetation that is growing closely together.

Natural Forest: Natural forests include old growth and primary forests as well as managed forests where most of the principal characteristics and key elements of native ecosystems such as complexity, structure, wildlife and biological diversity are present.

Semi natural forest: A forest ecosystem with many of the characteristics of native ecosystems present. Semi-natural forests exhibit a history of human disturbance (e.g., harvesting or other silvicultural activities), are very common in the United States, and include a considerable amount of unmanaged and most of the managed forest land other than plantations.

NOTE: Non-forest conditions include agriculture, development, and other infrastructure. Timber harvest and natural disturbances are not considered conversion to non-forest conditions 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.

Plantation: Forest areas lacking most of the principal characteristics and key elements of native ecosystems as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of either planting, sowing or intensive silvicultural treatments (source: FSC-STD-01-001).

The use of establishment or subsequent management practices in planted forest stands that perpetuate the stand-level absence of most principle characteristics and key elements of native forest ecosystems will result in a stand being classified as a plantation. The details addressing ecological conditions used in stand-level classification are outlined in related

guidance. Except for highly extenuating circumstances the following are classified as plantations:

- cultivation of exotic species or recognized exotic sub-species;
- 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;
- cultivation of any tree species in areas that were naturally non-forested ecosystems.

NOTE: Not all planted stands are plantations.

- Appendix G in the FSC-US Forest Management Standard provides additional details for: 1) guidance on the classification of plantations; 2) guidance on principle characteristics and key elements of native forest ecosystems; and 3) guidance on management practices related to plantations.
- A Plantation Classification Worksheet is available from the FSC US website: <http://us.fsc.org/download.fsc-us-plantation-classification-worksheet.205.htm>

‘Low Risk’ Thresholds from FSC-PRO-60-002a (NRA Framework:

- There is less than 5,000 ha (12,355 acre) net average annual loss or there is less than 0.02% net average annual loss of natural forest in the assessment area in the past 5 years; AND/OR
- Applicable legislation for the area under assessment covers laws that prevent conversion (to the outcome required by the indicator), AND the risk assessment for relevant indicators of Category 1 confirms that the law is enforced; AND
- Other available evidence does not challenge a ‘low risk’ designation (e.g., No significant economic drivers for conversion are identified; Data do not yield evidence that conversion is occurring on a widespread or systematic basis)

NOTE: The following changes are not considered applicable conversion according to FSC-PRO-60-002a (NRA Framework): (legal) road construction, logging landings, and infrastructure development to support forestry operations

Category 4 Risk Assessment

The following assessment was developed by FSC US staff, building upon the work completed by and for the original National Risk Assessment Working Group (NRA WG). It begins with an assessment of applicable legislation to determine whether natural vegetation land use changes are prevented (or kept to a level that does not exceed the stated threshold) by US legislation or public policy. This is followed by an assessment of whether the spatial threshold was exceeded, which consisted of a data analysis using data sets that were consistent for as much of the assessment area as possible were used. The remainder of the assessment was based upon regional and finer-scale data, literature reviews and consultation with experts.

Assessment of Applicable Legislation:

Legislation relevant to the conversion of natural forests to plantations or non-forest use.

- There is no separate legal framework that governs conversion of forest land in the US. Conversion, if addressed, is typically covered by legislation for harvesting timber.

- Federal Lands:
 - Federal law requires the maintenance of forest within National Forests (16 USC §§ 475)
 - The National Forest Management Act (NFMA) of 1976 § 6(g), directs the US Forest Service to develop planning regulations that provide for preservation of biodiversity and restocking after harvest for lands that they administer (i.e., National Forests).
 - The key law for Bureau of Land Management (BLM) timberlands, the O & C Lands Act, calls for management for permanent forest production, 43 USC §.
- Each state likely has similar requirements for the forested lands that they administer, but each state will be unique.
- For private lands, the key laws will usually be state and local land use laws. These will vary greatly from state to state, and from municipality to municipality. Even in states that do not require local zoning ordinances, it is a planning tool that is used by essentially all major urban areas.
- Forested wetlands on all ownership types are subject to Clean Water Act § 404 regulation, which is administered by state government in most states. While silvicultural activities must comply with the requirements of this legislation, they are exempt from the requirement to acquire a permit prior to implementation of activities. However, conversion of forests is not considered normal silvicultural activity and so is not exempt from § 404 permit requirements.

Summary: There is not any national legislation related to conversion, most states regulate conversion of wetlands, but the most applicable legislation would be local zoning ordinances. However, local zoning ordinances vary greatly, and there is no possible way to evaluate them across the assessment area (there are 1800 local municipalities in Michigan alone). Therefore, while the risk assessment for relevant indicators in Category 1 does conclude that laws in the US are enforced, it is not possible to conclude from this assessment that applicable legislation prevents conversion to the outcome required by the indicator, and therefore it is necessary to complete an assessment of the rates and extent of conversion in the area being assessed as part of the National Risk Assessment.

Sources:

1. 16 U.S. Code § 475 - Purposes for which national forests may be established and administered, Legal Information Institute (<http://www.law.cornell.edu/uscode/text/16/475>)
2. 16 U.S. Code § 1604 - National Forest System land and resource management plans, Legal Information Institute (<http://www.law.cornell.edu/uscode/text/16/1604>)
3. 43 U.S. Code § 2601 - Conservation management by Department of the Interior; permanent forest production; sale of timber; subdivision, Legal Information Institute (<https://www.law.cornell.edu/uscode/text/43/2601>)
4. US Forest Service video (https://www.youtube.com/watch?v=IFNe_KZhPZw#t=15)
5. US Department of Agriculture. 2011. National Report on Sustainable Forests—2010 (<http://www.fs.fed.us/research/sustain/national-report.php>)

Assessment of Rates, Extent and Drivers of Conversion:

Ecoregion-Scale Assessment

The NRA WG 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)⁵⁶ and National Land Cover Dataset (NLCD)⁵⁷.

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. Due to these limitations, FIA could not (as of 2014) be used in the Western US, or in a few eastern ecoregions with small sample sizes. Where it is available, FIA provides a reasonably robust dataset for estimating rates of conversion.

NLCD data does not directly distinguish between permanent forest cover loss (conversion) and temporary loss due to harvest or disturbance. 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.

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.

The NRA WG 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 NRA WG, additional sub-regional estimates of conversion were made to provide more spatially explicit assessments of specified risk.

National Council for Air & Stream Improvement (NCASI) produced an analysis for FSC US of FIA data for the eastern US ecoregions, and an NLCD analysis for western US ecoregions. 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 [Source: 23]. Their results demonstrate that the standard error associated with these FIA analyses is almost always greater than the difference between the estimates and a 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.

FSC US then analyzed the same datasets with slightly different assumptions and methodologies. The FSC US analysis used the newer World Wildlife Fund (WWF) ecoregion delineations instead of Bailey's ecoregions. In the FSC US analysis, 10 out of 20 eastern

⁵⁶ <https://www.fia.fs.fed.us/tools-data/>

⁵⁷ <https://www.mrlc.gov/index.php>

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.

Note that Global Forest Watch data⁵⁸ were reviewed, but were not used to analyze conversion for the risk assessment for a number of reasons. Global Forest Watch data on forest change does not distinguish between types of forest management, legality of harvest, or the cause of forest loss (natural disturbance versus human-caused). Even a well-managed harvest will show as forest loss on Global Forest Watch data. Additionally, the replacement of natural forest with a plantation would be considered forest gain. Some types of silvicultural practices, including even-aged management, clear cuts and final harvests, are used more frequently in the United States than in other parts of the world and would show as 'converted' with this kind of remote sensing data analysis. These data limitations lead to FSC US considering Global Forest Watch as an inconclusive data source for assessing conversion from forest to non-forest cover for the purposes of the NRA.

Overall both the FIA and NLCD 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. [Source: 23] emphasize that the expected estimates of error for FIA data analyses 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.

Summary: Due to these limitations, it is not possible to conclusively determine whether the conversion rates actually exceeded the 0.02% threshold, as required by Indicator 4.1 of the National Risk Assessment Framework procedure (FSC-PRO-60-002a). These analyses clearly demonstrate that at an ecoregion scale, forest cover in the assessment area is relatively stable. However, there is evidence that forest conversion continues to be an issue at a sub-ecoregional scale [Sources: 12,15,20,22].

SubEcoregion-Scale Assessment

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. However, the rate of forest loss in the US has slowed and some areas are beginning to gain forestland. [Source: 13, 15] 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. [Sources: 13, 17] These data indicate that conversion to agricultural lands is likely no longer a driver for conversion of forested lands. Additionally, while tree plantations are expected to continue to increase in extent in the US, this will most likely occur through afforestation (from agricultural lands), not conversion of existing forests [Source: 18]. This leaves urbanization as the strongest pressure for forest conversion, a conclusion that is supported by numerous sources. [Sources: 7, 9, 10, 11, 12, 25] Therefore, FSC US staff concluded, in consultation with the NRA WG, that population growth and the

³ http://data.globalforestwatch.org/datasets?group_ids=eb644fddcce44adaaf525757ed0f53c7

associated urban development present the best possible proxy for forest conversion in this risk assessment.

Evidence indicates that forestland is growing in the North Central (a broad area that includes the FSC US Great Lakes Region and the northern portion of the FSC US Non-Forested Region), Northeastern, and Rocky Mountain portions of the United States, while the Southeast and Pacific Coast regions are experiencing forest loss and concurrent rapid population growth. [Sources: 7,24]

Within the Southeastern United States, the highest rates of urban development are occurring in the Piedmont region from northern Georgia through North Carolina into Virginia. Forest loss is also occurring along the Atlantic Coast and in eastern Texas. [Source: 9,10,11,12] Despite the high rates of urban growth and development across the Southeast, this growth is not consistent across the region. [Source 12]

The Pacific Coast Region is also experiencing urban growth leading to conversion from forest to non-forest land use, though this growth appears to be concentrated on the western portions of Washington and Oregon. [Source 8,16] The National Resources Inventory has indicated a decline in forest land in the three Pacific Coast states. [Source 13] However, the most recent assessment of California's Forests and Rangelands indicates that in the most recent years assessed, wildfire disturbance was the most common disturbance in forests [Source 30].

Indication of Risk: In the United States, there is no legal framework that consistently or comprehensively governs conversion of forestland to non-forestland or from forestland to plantation. Overall, the rate of deforestation in the US is very low. Urban development has been found to be a primary driver of conversion from forest to non-forest land uses [Sources: 7,9,10,11,12,25]. Rates of urban development vary throughout the United States with higher rates in the Pacific Coast region and portions of the Southeast Region [Sources: 7,24]. These two regions are also the regions identified as experiencing more recent forestland loss. Therefore, the greatest risk of materials entering the supply chain from conversions will most likely be in these two regions; however, the risk is not consistent across the regions.

Conversion is driven by population growth and the associated urban development. Therefore, population growth by county between 2015 and 2016 and residential building permits issued by Core Based Statistical Areas (CBSAs) over the same time period were used together as a proxy to identify counties where there is likely a greater risk of materials from conversions entering the FSC supply chain. [Sources: 26,27] CBSAs consist of the county or counties associated with a core urbanized or urban area with a population of at least 10,000. These data were analyzed using a population growth threshold of 2% and a building permits issued threshold of 1500. These thresholds were selected based on analyses done by the US Census Bureau [Source 28] and the US Department of Housing and Urban Development. [Source 29] Additionally, non-forested portions of counties were removed (based upon the forest cover data layer available from the IFL Mapping Team⁵⁹).

Risk Designation:

- Pacific Coast Region: Specified Risk for the following counties:
 - Oregon: Columbia, Deschutes*, Yamhill
 - Washington: Pierce, Snohomish, Thurston
- Southeast Region: Specified Risk for the following counties:
 - Alabama: Baldwin

⁵⁹ Forest Zone Extent (<http://www.intactforests.org/data.ifl.html>)

- Delaware: Sussex
- Florida: Clay, Collier, Flagler, Hernando, Hillsborough, Lake, Lee, Nassau, Orange, Osceola, Pasco, Polk, Santa Rosa, St. Johns, St. Lucie, Volusia
- Georgia: Barrow, Bryan, Cherokee, Clayton, Columbia, Effingham, Forsyth, Henry, Paulding
- North Carolina: Brunswick, Cabarrus, Chatham, Currituck, Johnston, Mecklenburg, Pender, Wake
- South Carolina: Berkeley, Horry, Jasper, Lancaster, York
- Texas: Bastrop*, Brazos*, Liberty*, Montgomery, Waller*
- Virginia: Loudoun, New Kent
- Remainder of the assessment area: Low Risk

NOTE: An asterisk (*) denotes counties that are only partially designated due to non-forested portions being removed.

NOTE: Static PDF maps of specified risk designations are available on the FSC US web site and a spatial data layer is available upon request.

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Category 4 Control Measures

If an organization wishes to source from a specified risk area, addressing the specified risk through implementation of one of the following two Control Measures is mandatory (CM 4.1 or CM 4.2). If an organization finds that these control measures are inadequate to mitigate risk found in its specific operations, and the conditions established by Clause 4.13 of the Controlled Wood standard (FSC-STD-40-005 V3-1) apply, the organization may replace the following mandatory control measures with more effective control measures.

CM 4.1: The Organization is required to implement both parts of this Control Measure (CM 4.1.a and CM 4.1.b)

CM 4.1.a The Organization develops and implements binding written agreements with suppliers that: i) mitigate the risk that material supplied originates from forest areas converted into plantation or non-forest use; or ii) assure that if some conversion has occurred, that material supplied originates from limited and legal sources of conversion (e.g., conversion that results in conservation benefits, publicly approved changes in zoning in urban areas, etc.) and does not come from sources where the conversion threatens High Conservation Values.

CM 4.1.b The Organization implements CM 4.2.b.

Effectiveness Verification for Control Measure CM 4.1: The Organization is responsible for demonstrating the effectiveness of its binding written agreements. FSC US will assess the effectiveness of actions implemented under 4.1.b, similar to as described below in 'Effectiveness Verification for Control Measure CM 4.2'.

CM 4.2: The Organization is required to implement both parts of this Control Measure (CM 4.2.a and CM 4.2.b)

CM 4.2.a: The Organization implements either CM 4.2.a.i or CM 4.2.a.ii for FSC US Regions relevant to the Organization's supply area:

CM 4.2.a.i: A representative of the Organization attends FSC US-coordinated Controlled Wood Regional Meetings when they occur. The meetings will include the following elements:

- Collaborative dialogues including both certificate holders and stakeholders that result in identification of a focused set of actions that fit within the framework detailed below, and that, if deemed appropriate by Regional Meeting participants, includes a range in the level of resource investment required for implementation. Actions identified must help to achieve one of the following outcomes⁶⁰:
 - A. Convene partners to identify and protect priority forest areas
 - B. Promote national policies and markets to help private landowners conserve forests

⁶⁰ Drawn from the U.S. Forest Service Open Space Conservation Strategy (https://www.fs.fed.us/openspace/national_strategy.html)

- C. Provide resources and tools to help communities expand and connect forests
- D. Participate in community growth planning to reduce ecological impacts and wildfire risks
- Sharing information, as requested by FSC US, to augment effectiveness verification of actions implemented as part of CM 4.2.b.

NOTE: It is recognized that depending on the information requested, it may not be possible to share it at the Controlled Wood Regional Meeting, and in this situation the Organization shall share it as soon as possible following the meeting.

NOTE: It is the intention of FSC US to strive for very diverse participation in the Controlled Wood Regional Meetings, including certificate holders, environmental organizations, social organizations, experts, academics, public agencies, and landowners who are not certificate holders.

NOTE: If the collaborative dialogues do not successfully identify a focused set of mitigation actions, FSC US will implement a contingency plan as detailed below.

NOTE: Following each Controlled Wood Regional Meeting, FSC US will produce a Report that includes: 1) A summary of information communicated in advance of, or at the meetings, regarding forest conversion; 2) The outcomes of the collaborative dialogues; and 3) Details of information that has been requested of certificate holders to augment effectiveness verification.

NOTE: The FSC US Board of Directors will review the outcomes of the Controlled Wood Regional Meeting collaborative dialogues (or contingency plan) for any significant risks to the system. It is the Board's intention to endorse these outcomes unless a risk is identified, in which case the Board will approve a revised set of actions that will be published in the Report with rationale for any changes.

Compliance Verification: The Organization demonstrates to their certification body that a representative of the Organization attended the meeting(s) held for the region(s) in which the Organization sources materials and the Organization shared the requested information.

CM 4.2.a.ii: The Organization reviews Controlled Wood Regional Meeting Report(s) and associated information and provides the information requested in the Report.

Compliance Verification: The Organization demonstrates to their certification body an awareness of all three elements of the Controlled Wood Regional Meeting Report and that the requested information was shared.

CM 4.2.b: The Organization shall implement one or more of the actions identified during the collaborative dialogue at the Controlled Wood Regional Meeting, as detailed in the Controlled Wood Regional Meeting Report. When options for action with differential levels of resource investment required for implementation are identified, the action(s) implemented shall be

commensurate with the scale and intensity of the Organization's potential impact on the forests in the region.

NOTE: The scale and intensity of the Organization's potential impact on the forests in the region will be informed by: 1) the volume of materials that are being sourced by the Organization from the specified risk area, and 2) the spatial extent of the specified risk area from which the Organization is sourcing materials.

Compliance Verification: The Organization demonstrates when and how the action(s) identified was implemented and why that action(s) was selected.

Effectiveness Verification for Control Measure CM 4.2:

The Organization shall provide input into the effectiveness verification process through its implementation of CM 4.2.a.i. An assessment of the effectiveness of actions implemented in reducing the risk of sourcing from lands where natural or semi-natural forests are being converted to non-forest or plantations shall be determined by FSC US, in consultation with stakeholders, by evaluating the outcomes from each of the three elements of the Controlled Wood Regional Meetings and comparing them with outcomes from previous meetings, in combination with other monitoring data shared by stakeholders. The results of this assessment will be incorporated into the Controlled Wood Regional Meeting Report and will be used to inform future revisions to the National Risk Assessment.

NOTE: While effectiveness verification will be linked to the Controlled Wood Regional Meetings, which are expected to occur every 3 to 5 years, the Organization is still responsible for reviewing its Due Diligence System at least annually (as specified in FSC-STD-40-005 V3-1, Clause 1.6) to determine if any revisions to the Organization's Due Diligence System are needed.

Contingency Plan for CM 4.2.a

In the event that the Controlled Wood Regional Meeting collaborative dialogues do not come to a successful resolution, the following will be implemented in sequential order until a resolution has been achieved.

4. A small group of certificate holder and stakeholder representatives from the region is formed to build on the information and perspectives shared during the dialogue at the regional meeting. The participants in the group are identified at the regional meeting at the point when it is apparent that it will not be possible find agreement on a set of mitigation actions by the end of the meeting. The participants must have demonstrated an ability to represent the perspective of the chamber with which they are most aligned, an ability to be open to other perspectives and new ideas and an ability to compromise. This group will be asked to complete the process within a short timeframe.
5. If the small group participants are not successfully identified at the regional meeting, FSC US will solicit participants representing a diversity of perspectives and formalize a group in consultation with the FSC US Board of Directors. (with the same constraints on participation as detailed above). Similar to #1 above, this group will be asked to build on the dialogue held at the regional meeting and develop a set of mitigation actions.
6. If the small group in #1 or #2 above is unable to find agreement on a set of mitigation actions within 6 weeks of the Controlled Wood Regional Meeting, FSC US Staff will

build on the dialogue held at the regional meeting and the discussions of the small group, and develop a draft set of mitigation actions to be approved by the FSC US Board of Directors prior to being published in the regional meeting report.