

Guidance for Forest Management Plans

Meeting Forest Stewardship Council requirements

Forest Stewardship Council® (FSC®) certification entails following rigorous criteria and carrying out active stewardship practices. Forest management plans are an essential component of an FSC-certified operation. No matter the size of the property, it must have a forest management plan, *appropriate to the scale and intensity of forest management*.

This document covers the following topics:

- **Basic Guidance**
- **Required components of FSC-certified Forest Management Plans**
- **Typical additions to Forest Management Plans to meet FSC requirements**
- **Sample Forest Management Plan outlines**
- **Appendix: Principle 7: Management Plans - *an excerpt from FSC-US Forest Management Standard***

Basic Guidance

FSC certification requires that Forest Management Plans be actively maintained by the land manager, this includes:

- Preparing an overall update of the plan every 10 years.
- Including updates or adding appendices when significant changes to the forest occur, these include:
 - timber harvest
 - major natural disturbances that alter development of the forest
 - changes to information or scientific findings guiding management
 - changes to land manager's management objectives
 - changes to the schedule for carrying out activities and tasks documented in the plan

If you don't already have a forest management plan, both Oregon and Washington provide comprehensive outlines for forest owners and managers, which can be found online at: <https://www.nnrg.org/resources/template-plans/>.

The Forest Management Plan may consist of a variety of documents or an umbrella document that describes how a collection of management documents relate to an integrated strategy for managing the forest. This may include a combination of ownership level plans, unit plans, site level plans (e.g. harvest plans), GIS, published guidelines (e.g. regional silviculture or BMP guides), landowner policies, and other information.

FSC certification requires that the *conditions of the forest* and the *descriptions in the management plan* be a reflection of one another. Thus, land managers need to follow the activity schedule described in their management plan or adjust the plan schedule to meet the actual timeline and circumstances. How land managers steward forests on the ground is of utmost importance.

Public lands resource managers are required to make their management plans and information publicly available.

Required components of FSC-certified Forest Management Plans

The detailed requirements for an FSC-compliant management plan are described in FSC Principle 7: Management Plan. The full text of Principle 7 and its indicators are included as an appendix to this document. The chart below lists the minimum content that a management plan should contain in order to comply with the FSC Standards. The plan does not need to follow this outline explicitly, but must contain information relating to each of these criteria somewhere in its content.

Management Plan Section	Required content (reference to FSC standard)	Explanation
Property overview	Management objectives (6.3, 7.1.a, 7.1.c, 7.1.d)	What do I plan to do on my property? - ecological, silvicultural, social, and economic objectives What do I want the forest to look like in the future? Describe legal ownership information – including rights of owner and rights held by others and ownership type. History of land use and past management. Historic sites.
Soils Forest inventory, timber and wood products Wildlife habitat	Description of the forest resources (6.3, 7.1.a, 7.1.b)	Soil resources Current age and species composition of the forest. Major features within the forest, such as streams and water resources. Describe location and protection of rare, threatened, endangered species and plant community types. Description of plant species community diversity and wildlife habitat.
Forest inventory, timber and wood products	Environmental protection based on the assessment (6.1, 7.1.q)	What are the risks posed by forestry? How will I protect, restore or reduce negative impacts?
Forest inventory, timber and wood products	Description of silvicultural systems (6.3.a, 7.1.c, 7.1.l)	Rate and volume of anticipated timber harvest.
Forest inventory, timber and wood products	Rational for rate of harvest (5.6.b, 7.1.m)	Quantitative measurement and computation of current timber volume and expected growth. Annual allowable cut.
Forest inventory, timber and wood products	Justification for choice of harvesting technique (5.6, 6.5, 7.1.m, 7.1.p)	Based largely on the silvicultural system and the forest resource (timber size and topography); may include recommendations for harvesting machinery and techniques to be used.
Forest health, wildfire & invasive species	Description of risks to forest health (7.1.g)	Describe forest health topics such as insects, diseases – both current and anticipate outbreaks – and how they will be managed.

Management Plan Section <i>continued</i>	Required content (reference to FSC standard)	Explanation
Forest health, wildfire & invasive species	Chemical use and biological controls (6.6, 7.1.h, 7.1.i)	If chemicals or biological controls are used, what is being used, application methods, and effectiveness.
Forest health, wildfire & invasive species	Invasive species management (6.3.j, 7.1.f)	Describes invasive species conditions, applicable management objectives, and how they will be controlled.
Property access, roads & trails	Transportation network (7.1.k)	Describe the road and trail system, its purpose, condition and maintenance needs. Describe the culvert and drainage infrastructure and maintenance needs.
Monitoring	Monitoring (7.1.n, 8.2)	The forest resource must be monitored and measured regularly. Who will go into the forest and when? What will monitors look for? Monitoring includes evaluating forest health, forest growth, wildlife & habitat, chemical use impacts, road & culvert systems.
Monitoring Property access, roads & trails Forest health, wildfire & invasive species	Additional monitoring of chemical use and road conditions (8.2.d.2)	Document Chemical Use Policy & Maintain Records for Reporting, Monitor Effects of Herbicides and understand the impacts of road system to environment.
Wildlife habitat	Protection of rare, threatened and endangered species (6.3)	Describe location and protection of rare, threatened, endangered species and plant community type - use database research and field survey work. List species and locations. Use maps.
Maps	Maps (7.1.o)	The scale depends on the size of the property. List of map subjects includes boundaries, management units, protected sites, roads & trails, water bodies, topography, archeological & cultural sites (<i>these do NOT need to be made public</i>), unique & sensitive areas, habitat features, rare, threatened & endangered species, designated HCVF.
Appendix	Stakeholder consultation process (7.1.r)	Describe the stakeholder consultation process - <i>this applies to public lands and large-scale ownerships.</i>

Typical additions to Forest Management Plans to meet FSC requirements

The following topics are some of the most common additions land managers need to add to existing Forest Management Plans to meet FSC requirements. These topics are not in the Oregon or Washington forest management plan templates.

- **Inclusion of the annual allowable cut**
- **Inclusion and application of FSC riparian management zones**
- **Documentation and monitoring of chemical use**
- **Annual monitoring of forest**
- **Annual monitoring of road and drainage systems**
- **Documentation of High Conservation Value Forests**

Inclusion of the annual allowable cut

The annual allowable cut (AAC) can also be referred to as the sustained yield or annual allowable harvest. The annual allowable cut is the amount of wood fiber that can be harvested within a specific time period and is considered an upper limit on a sustainable harvest volume.

As per the Forest Stewardship Council management standards outlined in Principle 5: Benefits from the forest:

"Forest management operations shall encourage the efficient use of a forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits."

Further detailing implementation of this principle is Criteria 5.6.a:

"The rate of harvest of forest products shall not exceed levels which can be permanently sustained."

The term "sustained yield harvest" or, annual allowable cut, refers to harvest levels and rates that do not exceed growth over successive harvests, that contribute directly to achieving desired future conditions, and that do not diminish the long term ecological integrity and productivity of the site. As such the landowner or manager calculates the sustained yield harvest level for the forest and this calculation is documented in the management plan.

Land managers prepare the annual allowable cut calculation based on a number methods, including: yield tables and site index for given stands, soil productivity estimates based on Natural Resources Conservation Service soil survey data, and modeling actual growth and yield measurements from conducting inventory for given stands. Whatever method is used must be documented in the management plan.

Inclusion and application of FSC riparian management zones

Note: FSC requirements are superseded when and where state or federal laws, regulations, or other contractual requirements are more stringent.

Wetlands are identified as per the local regulatory agencies (WA DNR, ODF, County, etc.). If the local agency identifies a wetland on the ground, then the forest manager should apply the appropriate FSC buffer requirements to the wetland area.

Forest management within the riparian zone of all streams and wetlands needs to adhere to the following standards at a minimum.

- 1. Retain and recruit sufficient large, green trees; snags; understory vegetation; down logs; and other woody debris in riparian zones to provide shade, erosion control, and in-channel structures.**
- 2. For Type F & S (fish bearing and Shorelines of the state) streams, and for lakes and wetlands larger than one acre, an inner buffer zone is maintained.**

The inner buffer is at least 50 foot wide (slope distance) from the active high water mark (on both sides) of the stream channel and increases depending on forest type, slope stability, steepness, and terrain.

In this inner buffer, harvest activities:

- a. maintain or restore the native vegetation
 - b. are limited to single-tree selection silviculture
 - c. retain and allows for recruitment of large live and dead trees for shade and stream structure
 - d. retain canopy cover and shading sufficient to moderate fluctuations in water temperature, to provide habitat for the full complement of aquatic and terrestrial species native to the site, and maintain or restore riparian functions
 - e. exclude use of heavy equipment, except to cross streams at designated places, or where the use of such equipment is the lowest impact alternative
 - f. avoid disturbance of mineral soil; where disturbance is unavoidable, mulch and seed are applied before the rainy season
 - g. avoid the spread of pathogens and noxious weeds
 - h. prohibit road construction and reconstruction with the exception of stream crossings
- 3. For Type F & S (fish bearing and Shorelines of the state) streams, and for lakes and wetlands larger than one acre, an outer buffer zone is maintained.**

This buffer extends from the outer edge of the inner buffer zone to a distance of at least 150 foot from the edge of the active high water mark (slope distance, on both sides).

In this outer buffer, harvest occurs only where:

- a. single-tree or group selection silviculture is used

- b. post-harvest canopy cover maintains shading sufficient to moderate fluctuations in water temperature, provide habitat for the full complement of aquatic and terrestrial species native to the site, and maintain or restore riparian functions
 - c. new road construction and reconstruction is prohibited (with the exception of stream crossings)
 - d. disturbance of mineral soil is avoided; where disturbance is unavoidable, mulch and seed are applied before the rainy season
- 4. For Type N (non-fish bearing) perennial streams, a 25-foot (slope distance) inner buffer is created and managed according to provisions for inner buffers for Type F & S waters. A 75-foot (slope distance) outer buffer (for a total buffer of 100 feet) is created and managed according to provisions for outer buffer for Type F & S waters.**
- 5. For Type N (non-fish bearing) seasonal streams that support aquatic species, and for lakes and wetlands smaller than one acre, a buffer zone 75 feet wide (on both sides of the stream) is established that constrains management activities to those that are allowed in outer buffer zones of Type F & S waters.**
- 6. For Type N (non-fish bearing) seasonal streams that do not support aquatic species, management:**
- a. maintains root strength and stream bank and channel stability
 - b. recruits coarse wood to the stream system
 - c. minimizes management-related sediment transport to the stream system

Summary of minimum riparian buffer standards

This is a summary of minimum riparian buffer standards to be applied per the Forest Stewardship Council's U.S. Forest Management Standards for the Pacific Coast region. FSC requirements are superseded when and where state or federal laws, regulations, or other contractual requirements are more stringent.

Wetlands are identified as per the local regulatory agencies (WA DNR, ODF, County, etc.). If the local agency identifies a wetland on the ground, then the forest manager should apply the appropriate FSC buffer requirements to the wetland area.

Water type	Management standards
<ul style="list-style-type: none"> • Fish bearing stream – Type F or S • Shorelines • Lakes & wetlands > 1 acre 	Minimum riparian management zone width: 150 foot 50 foot inner zone 100 foot outer zone <ul style="list-style-type: none"> • Single-tree selection in inner zone • No equipment in inner zone • Single & group tree selection in outer zone
<ul style="list-style-type: none"> • Non-fish bearing stream, perennial 	Minimum riparian management zone width: 100 foot 25 foot inner zone 75 foot outer zone <ul style="list-style-type: none"> • Single tree selection in inner zone • Single & group tree selection in outer zone
<ul style="list-style-type: none"> • Non-fish bearing stream, seasonal. Supports aquatic species. • Lakes & wetlands < 1 acre 	Minimum riparian management zone width: 75 foot <ul style="list-style-type: none"> • Single-tree or group selection
<ul style="list-style-type: none"> • Non-fish bearing stream, seasonal. Does not support aquatic species 	No prescribed buffer width Management must: <ul style="list-style-type: none"> • Maintains root strength and stream bank and channel stability • Recruit coarse wood to the stream system

FSC Pacific Coast Region Stream definitions:

Category A stream: *A stream that supports or can support populations of native fish and/or provides a domestic water supply.*

Category B stream: *Perennial streams that do not support native fish and are not used as a domestic water supply.*

Category C stream: *An intermittent stream that never the less has sufficient water to host populations of non-fish aquatic species.*

Intermittent streams are mapped or unmapped stream that typically flows for less than twelve months of the year and/or that flows below ground for portions of its length.

Category D stream: *A stream that flows only after rainstorms or melting snow and does not support populations of aquatic species.*

Documentation and monitoring of chemical use

Forest management plans must indicate whether pesticides will be used. If pesticides will be used, the land manager must document the chemical, the quantity, the targeted pest species, the risks involved, and include a map of areas where pesticides could be used.

Land managers need to regularly monitor their property for pest outbreaks. In some circumstances, exotic or invasive pests can only be effectively controlled with chemical pesticides. Permitted chemical compounds should only be used when clearly justified by the circumstances.

All pesticides, or toxicants, used to control pests and competing vegetation, including rodenticides, insecticides, herbicides, and fungicides should be used only when and where non-chemical management practices are:

1. Not available
2. Prohibitively expensive, taking into account overall environmental and social costs, risks and benefits
3. The only effective means for controlling invasive and exotic species
4. Result in less environmental damage than non-chemical alternatives (e.g. top soil disturbance, loss of soil litter and down wood debris)

If chemicals are used, the forest owner or manager must use the least environmentally damaging formulation and application method practical. Further, land managers need to develop written **strategies** that justify the use of any chemical pesticides, and a written **prescription** that includes, at a minimum, the following: the chemical, the quantity, and the targeted species. Prescriptions should also describe the site-specific hazards and environmental risks, and the precautions that workers will employ to avoid or minimize those hazards and risks, and include a map of the treatment area. These prescriptions should be included in the forest management plan. The level of detail of the prescription and application procedures will depend on the U.S. EPA rating of the chemical. Common general use pesticides require only brief and less technical procedures, while restricted use pesticides require more detailed, technical procedures.

Restricted Use pesticides, as defined by the U.S. EPA, may only be purchased and applied by licensed applicators with current safety and training certificates. With respect to EPA rated General Use pesticides, an applicator must have at least informal training, and application procedures must be consistent with pesticide label requirements. All pesticide use, regardless of its EPA rating, must be consistent with product label directions and written management plan prescriptions. Members are responsible for informing workers of the risk of pesticide exposure and how to limit exposure. Management plans need to include, whenever possible, a strategy to phase-out chemical use.

Reporting to NNRG about chemical use

If chemicals are used, land managers need to **monitor** the effects. Land managers need to keep written records of:

- pest occurrences
- control measures
- incidences of worker exposure to chemicals

Land managers also need to keep a written log or list, and report the following information to NNRG during the annual check-in process:

- chemicals used
- application dates
- quantities
- method of application
- the location and area treated
- effectiveness of application

Example of reporting format for chemical use during annual FSC check-in with NNRG:

Target Species:

Herbicide:

Method:

Dates:

Observations on effectiveness, impacts:

Year	Amount herbicide (oz)	Tank mix (gallons dilution)	Area treated (ac)	Application Rate (oz/ac)	Application Method	Location (management unit)

Example of management plan text pertaining to Use of Chemicals in the Forest

Forest management on the property employs the use of silvicultural systems, integrated pest management, and strategies for controlling pests or invasive species that minimize the need for the use of chemicals.

Specifically, chemicals are only used where less environmentally hazardous techniques have been shown through research or empirical experience to be ineffective. Chemical use has been deemed necessary to control invasive weed species that have the potential to alter forest habitat function and in some cases where invasive or native species are aggressively encroaching on active forest roads. When chemicals are applied, the least environmentally hazardous option will be used to minimize effects on non-target organisms or ecological systems.

Furthermore, where chemical use is deemed necessary, the landowner, as a trained applicator, will follow all applicable safety precautions. Chemicals will be stored and disposed of in a safe and environmentally appropriate manner. Land manager will actively monitor chemical application sites not only to determine effectiveness but also to check for residue damage or unintended consequences.

Herbicides in use include:
[list species here]

Records of chemical use will be maintained, including the type of chemical, when and where it was applied, on what species it was applied and the effectiveness of the application.

All chemical use will be in accordance with FSC-US standards as per the following guidelines:

Table 6. Chemical use guidelines Standard	Source
Chemical pesticides, fungicides, and herbicides will be used only when and where research or empirical experience has demonstrated that less environmentally hazardous, non-chemical pest/disease management practices are ineffective.	FSC U.S. Standards 6.6.b.
When and where chemicals are applied, the most environmentally safe and efficacious chemicals are used. Chemicals are narrowly targeted, and minimize effects on non-target species.	FSC U.S. Standards 6.6.c.
Chemicals will be used only when and where they pose no threat to supplies of domestic water, aquatic habitats, or habitats of rare species.	FSC U.S. Standards 6.6.d.
When chemicals are used, the effects and impacts will be monitored and the results used for adaptive management. Records will be kept of pest occurrences, control measures, and incidences of worker exposure to chemicals.	FSC U.S. Standards 6.6.e.

Annual monitoring of forest

At a minimum, FSC requires that land managers maintain a basic monitoring program to document the following forest management attributes:

1. Yield of all forest products harvested.
2. Growth rates, regeneration and condition of the forest.
3. Harvested volume of non-timber forest products and condition of harvested areas.
3. Composition and observed changes in the flora and fauna.
4. Environmental impacts of harvesting and other operations.
5. Costs, productivity, and efficiency of forest management.

Additional qualitative forest monitoring should be conducted during regular walks through the forest, and the resulting field notes periodically added to an appendix of the forest management plan. Management plans should then be periodically updated based on the results of monitoring.

The following attributes should be monitored, at a minimum, via written observations:

1. Growth of newly planted seedlings.
2. Location, presence, and abundance of invasive species.
3. Fish and wildlife presence.
4. Snags and downed logs.
5. Forest roads and drainage systems.
6. Chemical use (chemical type, application date, amount, method, effectiveness).

Remember: Photo points count as monitoring too! They are a helpful addition to your records and show changes over time.

The remainder of this document provides both detailed monitoring guidelines that have been extrapolated from the FSC Standards, and the literal FSC Standards, which can be used to help craft a customized and detailed monitoring plan for your forest.

Annual monitoring of road and culvert systems

Per the FSC-US Forest Management Standard, Indicator 8.2.d.2: land managers need to have a forest road system monitoring program in place to assess the condition and environmental impacts. Land managers will document and describe the road system infrastructure, areas of high risk, and describe how the monitoring and maintain the transportation system. Land managers will annually monitor their forest's transportation system, including culverts and other drainage.

Monitoring includes:

- Observing (then maintaining) bridges, culverts, and ensuring functional drainage
- Observing (then maintaining) roads for large cracks, sink holes, other damage or indicators or erosion
- Observing uphill side of roads for erosion into ditch systems
- Observing downhill side of roads for erosion into streams, ponds, or wetlands
- Observing water flows
- Evaluating orphaned roads, culverts, bridges, and road conditions

Documentation of High Conservation Value Forests

High Conservation Values Forests (HCVFs) are an important aspect of FSC certification. The purpose of the HCVF principal in the FSC standard is to ensure identification and proper management of forest areas with exceptional conservation value. Larger properties and higher intensity harvesting requires closer evaluation of these factors.

HCVFs are rare, and only certain properties are likely to contain forest conditions that meet FSC's HCVF criteria. Factors that contribute to HCVFs are:

- Exceptional biodiversity
- Exceptionally intact forest landscapes
- Underrepresented or rare ecological communities
- Threatened species or ecological communities
- Fragile ecological characteristics that could be easily damaged by active forestry operations
- Forests that protect water resources and human uses

FSC recognizes 6 criteria for HCVF, a forest need only meet one of the criteria to be considered HCVF. These criteria are:

1. HCV forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia)
2. 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
3. HCV forest areas that are in or contain rare, threatened or endangered ecosystems
4. HCV forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)
5. HCV forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) 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)

Forest Management Plans need to identify HCVFs in written description and on maps, document activities to maintain or enhance the attributes which define such forests. The forest owner or manager will identify and map the presence of High Conservation Value Forests (HCVF) within the FMU and, to the extent that data are available, and includes a summary of the assessment and management strategies in the forest management plan. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach. Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

On public forests, a transparent and accessible public review of proposed HCV attributes and HCVF areas and management is carried out. Information from stakeholder consultations and other public review is integrated into HCVF descriptions, delineations and management. For public lands, the forest management plan is publicly available.

Sample Forest Management Plan outlines

The relevant topics for a Forest Management Plan can be organized in many ways. Below is one example outline and further description.

An example of a possible outline for a forest management plan

1. Cover page
2. Table of contents
3. Landowner objectives
4. Introductory overview of property
5. Descriptions of resources and management practices in the following categories:
 - a) Forest Health/Wildfire/Invasive Species
 - b) Soils
 - c) Water Quality/Riparian & Fish Habitat/Wetlands
 - d) Forest Inventory/Wood Products
 - e) Property Access/Roads & Trails
 - f) Fish & Wildlife
 - g) Protection of Special Resources
 - h) Aesthetics & Recreation
 - i) Specialized Forest Products (if applicable)
6. Management Plan Implementation Timeline
7. Monitoring topics and description of where monitoring information is kept
8. Maps

Further description of management plan components per the outline example are noted below.

1. Cover page

Forest name, owner, acreage, county, state, who prepared plan, date of current plan or update

2. Table of contents

3. Update short and long term goals and objectives (ecological, silvicultural, social, and economic)

- a. Short term (< 5-10 years)
- b. Long term (> 5-10 years)

4. Introductory overview of property/general property description

- a. **Describe land history, current conditions, ownership structure, socio-economic issues, etc.**
- b. **Regional landscape** - Describe land management practices within the forest's watershed that may have a bearing on the property.
- c. **Interaction with surrounding properties** - describe access, transportation, trails, adjacent land uses, etc.

5. Existing conditions and resources

Describe resources to be managed, including soils, timber, vegetation, fish & wildlife, water resources, special management zones, etc.

- a. **Stands** - Identify forest stands by community or habitat type, stand number and acreage.
- b. **Descriptive overview of stands** - Describe stands by cover type, age, tree/plant species & size, wildlife, soils, slope, aspect, stand history.
- c. **Stand silvicultural objectives** - Describe the desired future condition of each stand and the silvicultural system that will be used to achieve those conditions.
Should link to plan objectives and be consistent with regeneration data & regeneration strategies. Chosen management recommendation & course of action should be expressly identified for each stand. Describe harvesting techniques and equipment.

Determine the sustained yield harvest level (in mbf/yr) such that harvest levels and rates do not exceed growth over successive harvests. **This is the annual allowable cut calculation required for FSC certification.**

- d. **Stand inventory data**
For each stand, describe basal area, cords/acre, bd ft/acre, regeneration information, diameter distribution, etc. For all commercially harvested products, an inventory system is maintained that includes:
 - a) species
 - b) volumes
 - c) stocking
 - d) regeneration
 - e) stand and forest composition and structure
 - f) timber quality

Management concerns

Describe management strategies for exotic invasive plants, animals, insects and disease.

- e. **Property Access/Roads & Trails**
- f. **Fish & Wildlife**
Identify and describe significant fish and wildlife that utilize the site, the habitat quality for these species and any management activities to improve habitat conditions.
- g. **Protection of special resources:**
Rare, threatened or endangered species and/or high conservation value areas
Identify and describe rare, threatened and endangered species, unique habitats (if applicable)

Cultural/historic resources

Identify and describe cultural or historic resources, land use rights, and indigenous rights (if applicable).

- h. **Aesthetics/Recreation/Public access**
Describe recreational uses of land and public use or public use policy of land (if applicable).
- i. **Specialized Forest Products/Non-timber forest products**
Identify and describe any significant non-timber forest products and plans for managing and/or harvesting these products (if applicable).

6. Management Plan Timeline

Identify the schedule and timeline for management activities for the various management units. At a minimum the timeline should go out 10 years. Some counties or cost-share programs require plans to have a 30-year timeline.

The timeline is an adaptive management tool to prompt stewardship activities as well as the monitoring or evaluation to see if a stewardship activity is needed as per the recommended schedule; sometimes storm events, drought, or contractor delays will shift when a practice needs to occur, adjust the timeline as needed.

7. Monitoring

Describe the basic plan for monitoring forest growth and dynamics, wildlife habitat and impacts of management activities. Depending on the size and scale of your forest management, effective monitoring can take a variety of forms. Here are a few ideas:

- a) Establish a system of photo points around the property and develop a scrapbook that compares photos over the years.
- b) Twice per year, go on a monitoring walk through your forest and keep a journal with all your observations. Be sure to note:
 - Any invasive species
 - Forest health issues
 - Wildlife sightings
 - The effects of any disturbance such as a blowdown, harvest, fire, disease, etc.
 - The condition of all forest roads or trails, paying special attention to bridges and culverts. Are there any issues with erosion or runoff?
- c) Install a series of permanent monitoring plots which you can revisit every 10 years to measure forest growth.
- d) Monitor impacts of chemical use – is it effective (targeted populations declining), secondary impacts on non-targeted species, effectiveness of different treatment methods/seasons. Maintain records of the chemicals used, quantities used (concentrate and diluted), application dates, method of application, the location and acreage treated, and effectiveness of pesticides.
- e) Monitor transportation system and culverts to minimize erosion and sedimentation – at least annually.

8. Maps

Depending on the size of forest and intensity of management, maps should include:

- a. property boundaries and ownership
- b. roads and trails
- c. planned management activities including forest product harvest areas
- d. forest types by age class
- e. topography, soils, water courses and water bodies
- f. wetlands and riparian zones
- g. archeological and cultural sites and customary use areas

- h. locations of unique and sensitive natural communities, habitats and features
- i. rare, threatened and endangered species
- j. designated protected areas and High Conservation Value Forests

Second example of forest management plan components to meet the FSC requirements:

1. Quantitative and qualitative description of the forest resources to be managed, including at minimum stand-level descriptions of the land cover, including species and size/age class and referencing inventory information.
2. Description of silvicultural and/or other management system, prescriptions, rationale, and typical harvest systems (if applicable) that will be used.
3. Description of harvest limits (consistent with Criterion 5.6) and species selection.
4. Description of environmental assessment and safeguards based on the assessment, including approaches to: (1) pest and weed management, (2) fire management, and (3) protection of riparian management zones; (4) protection of representative samples of existing ecosystems (see Criterion 6.4) and (5) management of High Conservation Value Forests (see Principle 9).
5. Description of location and protection of rare, threatened, and endangered species and plant community types.
6. Management objectives (ecological, silvicultural, social, and economic) and duration of the plan.

Guidance: Objectives relate to the goals expressed by the landowner within the constraints of site capability and the best available data on ecological, silvicultural, social and economic conditions.

7. Quantitative and qualitative description of the forest resources to be managed, including at minimum stand-level descriptions of the land cover, including species and size/age class and referencing inventory information.

Guidance: In addition to stand-level descriptions of the land cover, information in site-level plans may include: landscape within which the forest is located; landscape-level considerations; past land uses of the forest; legal history and current status; socio-economic conditions; cultural, tribal and customary use issues and other relevant details that explain or justify management prescriptions.

8. Description of silvicultural and/or other management system, prescriptions, rationale, and typical harvest systems (if applicable) that will be used.
9. Description of harvest limits (consistent with Criterion 5.6) and species selection. Also, description of the documentation considered from the options listed in Criterion 5.6 if the FMU does not have a calculated annual harvest rate. A sustained yield harvest level analysis shall be completed. Data used in the analysis may include but is not limited to:
 - a. regional growth data
 - b. age-class and species distributions

- c. stocking rates required to meet management objectives
- d. ecological and legal constraints
- e. empirical growth and regeneration data
- f. validated forest productivity models

10. Description of environmental assessment and safeguards based on the assessment, including approaches to: (1) pest and weed management, (2) fire management, and (3) protection of riparian management zones; (4) protection of representative samples of existing ecosystems (see Criterion 6.4) and management of High Conservation Value Forests (see Principle 9).

Guidance: Regional environmental assessments and safeguards or strategies to address pest and weed management, fire management, protection of rare, threatened, and endangered species and plant community types, protection of riparian management zones, and protecting representative samples of ecosystems and High Conservation Value Forests may be developed by state conservation agencies. Site specific plans for family forests should be consistent with such guidance and may reference those works for clarity.

11. Description of location and protection of rare, threatened, and endangered species and plant community types.

12. Maps: Maps represent property boundaries, use rights, land cover types, significant hydrologic features, roads, adjoining land use, and protected areas in a manner that clearly relates to the forest description and management prescriptions.

13. Monitoring: Description of procedures to monitor the forest, including forest growth and dynamics, and other components as outlined in Principle 8. For Family Forests, the forest owner or manager develops and consistently implements a regular, comprehensive, and replicable *written* monitoring protocol. Monitoring may be scaled to the size and intensity of the management operations that affect the resources.

Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:

- I. Yield of all forest products harvested.
- II. Growth rates, regeneration and condition of the forest.
- III. Composition and observed changes in the flora and fauna.
- IV. Environmental and social impacts of harvesting and other operations.
- V. Costs, productivity, and efficiency of forest management.

For all commercially harvested products, an inventory system is maintained. The inventory system includes at a minimum: a) species, b) volumes, c) stocking, d) regeneration, and e) stand and forest composition and structure; and f) timber quality. *Guidance:* Information gathered and maintained as part of the inventory system is dependent on the scale and intensity of the management objectives.

Appendix: Principle 7 - Excerpt from FSC-US Forest Management Standard

Complete with FF Indicators and Guidance v1.0, 2010

Available at: <https://us.fsc.org/download.fsc-us-forest-management-standard-v1-0.95.htm>

Principle 7: Management Plan

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long term objectives of management, and the means of achieving them, shall be clearly stated.

Intent: This Principle is intended to ensure that management of the FMU is described in a comprehensive management plan. The plan should be developed with expertise and public input appropriate to the scale of the operation. The management plan, and the process of its development, should embody and consider all of the Principles and Criteria in this Standard.

The management plan may consist of a variety of documents or an umbrella document that describes how a collection of management documents relate to an integrated strategy for managing the forest. This may include a combination of ownership level plans, unit plans, site level plans (e.g., harvest plans), GIS, published guidelines (e.g., regional silviculture or BMP guides), landowner policies, and other information.

Guidance on scale and intensity of operations: All management plans regardless of the scale and intensity of operations must address the Indicators of Criterion 7.1 unless otherwise noted in the guidance below.

C7.1 The management plan and supporting documents shall provide:

- a) **Management objectives.**
- b) **Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.**
- c) **Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.**
- d) **Rationale for rate of annual harvest and species selection.**
- e) **Provisions for monitoring of forest growth and dynamics.**
- f) **Environmental safeguards based on environmental assessments.**
- g) **Plans for the identification and protection of rare, threatened and endangered species.**
- h) **Maps describing the forest resource base including protected areas, planned management activities and land ownership.**
- i) **Description and justification of harvesting techniques and equipment to be used.**

Intent: Criterion 7.1 ensures that a written management plan, as described in the Principle-level intent and guidance above, exists for the property within the scope of the certificate. The actions and objectives detailed in the plan are specific, achievable, measurable and adaptive. They are also sufficient to meet the requirements of this Standard.

Whenever the term “management plan” is used, it refers to any combination of documents and systems that meet the intent of the Indicator.

FF Supplemental Guidance: The management plan needs only to be as complex as the forest and activities to which it applies. It must include all components (a-i) listed in the Criterion, but some components may be addressed briefly and without reference to technical documents. It should be the judgment of the CB if the management plan is sufficient to capture decisions and activities in a manner consistent with FSC certification. A group of independent documents (multi-part plans) that addresses components listed in the Criterion (a-i) can serve as the management plan.

Indicator 7.1.a The management plan identifies the ownership and legal status of the FMU and its resources, including rights held by the owner and rights held by others.

Guidance: Legal status information may be summarized in the plan as appropriate to the scale and complexity of the ownership and the relevance of applicable legal constraints on management activities.

Ownership status includes ownership type (e.g., fee, easement, lease).

Rights held by others may include: customary uses and use rights; indigenous peoples' rights; conservation easements, deed restrictions, and other easements or rights held by others; and leasing arrangements.

FF Indicator 7.1.a A written management plan exists for the property or properties for which certification is being sought. The management plan includes the following components:

- i. Management objectives (ecological, silvicultural, social, and economic) and duration of the plan.
Guidance: Objectives relate to the goals expressed by the landowner within the constraints of site capability and the best available data on ecological, silvicultural, social and economic conditions.
- ii. Quantitative and qualitative description of the forest resources to be managed, including at minimum stand-level descriptions of the land cover, including species and size/age class and referencing inventory information.
Guidance: In addition to stand-level descriptions of the land cover, information in site-level plans may include: landscape within which the forest is located; landscape-level considerations; past land uses of the forest; legal history and current status; socio-economic conditions; cultural, tribal and customary use issues and other relevant details that explain or justify management prescriptions.
- iii. Description of silvicultural and/or other management system, prescriptions, rationale, and typical harvest systems (if applicable) that will be used.
- iv. Description of harvest limits (consistent with Criterion 5.6) and species selection. Also, description of the documentation considered from the options listed in Criterion 5.6 if the FMU does not have a calculated annual harvest rate.
- v. Description of environmental assessment and safeguards based on the assessment, including approaches to: (1) pest and weed management, (2) fire management, and (3) protection of riparian management zones; (4) protection of representative samples of existing ecosystems (see Criterion 6.4) and management of High Conservation Value Forests (see Principle 9).

Guidance: Regional environmental assessments and safeguards or strategies to address pest and weed management, fire management, protection of rare, threatened, and endangered species and plant community types, protection of riparian management zones, and protecting representative samples of ecosystems and High Conservation Value Forests may be developed by state conservation agencies. Site

specific plans for family forests should be consistent with such guidance and may reference those works for clarity.

vi. Description of location and protection of rare, threatened, and endangered species and plant community types.

vii. Description of procedures to monitor the forest, including forest growth and dynamics, and other components as outlined in Principle 8.

viii. Maps represent property boundaries, use rights, land cover types, significant hydrologic features, roads, adjoining land use, and protected areas in a manner that clearly relates to the forest description and management prescriptions.

Guidance: Property level maps for family forests may be simple and efficient to produce, and may cover only the necessary information needed for management to the FSC-US Family Forest Standard. At the group level, if GIS is used coverage should include protected areas, planned management activities, land ownership, property boundaries, roads, timber production areas, forest types by age class, topography, soils, cultural and customary use areas, locations of natural communities, habitats of species referred to in Criterion 6.2, riparian zones and analysis capabilities to help identify High Conservation Value Forests. Group managers may rely on state conservation agencies for complex GIS services.

Indicator 7.1.b The management plan describes the history of land use and past management, current forest types and associated development, size class and/or successional stages, and natural disturbance regimes that affect the FMU (see Indicator 6.1.a).

Guidance: This Indicator refers to information already compiled in Indicator 6.1.a

Natural disturbance regimes include wind, fire, insects, and pathogens. Typical disturbance events in terms of opening size, intensity disturbance, range, and frequency of disturbance are described to the extent they are known.

FF Indicator 7.1.b Actions undertaken on the FMU are consistent with the management plan and help to achieve the stated goals and objectives of the plan.

Indicator 7.1.c The management plan describes:

a) current conditions of the timber and non-timber forest resources being managed; b) desired future conditions; c) historical ecological conditions; and d) applicable management objectives and activities to move the FMU toward desired future conditions.

FF Indicator 7.1.c Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Guidance: “Current conditions” are based on forest inventories or other information sources, as applicable. The level of detail in the plan may be a summary of the inventory data, or more general in nature as indicated by the resource and is commensurate with the resource and intensity of management (e.g., general descriptions of water body or wetland types and extent may suffice).

“Desired future conditions” are the characteristics that describe the long-term (e.g., 30-50 years) vision of the FMU, such as the amount and age or development class distribution of forest types, species composition, products, habitats and values, and other resources. Desired future conditions must be consistent with the requirements of this Standard.

The purpose of establishing historic conditions is to facilitate creating a baseline for assessing environmental impacts of operations, to facilitate establishing desired future conditions, and to determine when restoration may be needed. When historic conditions are not available, best estimates from available sources may be used. Historic conditions should be used as guidelines for estimating ecological components of naturally occurring conditions.

“Management objectives” are typically time specific, measurable results that correspond to the goals.

Forest resources include timber, fish and wildlife, and NTFPs.

Indicator 7.1.d The management plan includes a description of the landscape within which the FMU is located and describes how landscape-scale habitat elements described in Criterion 6.3 will be addressed.

FF Indicator 7.1.d Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Guidance: The landscape description and landscape management objectives consider elements such as:

- land uses and trends in the surrounding landscape;
- a general description of forest ownership types and parcel sizes in the landscape;
- forest types, type of management, and general condition of forests within the landscape;
- significant water bodies and other features that cross the FMU boundary;
- diversity of habitats across the ownership, as indicated by forest type;
- species or species groups that may be significantly affected by habitat loss or fragmentation on the FMU.

Indicator 7.1.e The management plan includes a description of the following resources and outlines activities to conserve and/or protect:

- rare, threatened, or endangered species and natural communities (see Criterion 6.2);
- plant species and community diversity and wildlife habitats (see Criterion 6.3);
- water resources (see Criterion 6.5);
- soil resources (see Criterion 6.3);
- Representative Sample Areas (see Criterion 6.4);
- High Conservation Value Forests (see Principle 9);
- Other special management areas.

Guidance: The management plan should have sufficient detail to describe the current resources and how the landowner/manager complies with Criteria 6.2, 6.3, 6.4, 6.5, and Principle 9.

The plan may reference supporting guidelines and policies that describe specific management practices. Site-specific information and practices may be included in operational plans.

FF Indicator 7.1.e Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.f If invasive species are present, the management plan describes invasive species conditions, applicable management objectives, and how they will be controlled (see Indicator 6.3.j).

FF Indicator 7.1.f Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Guidance: The plan may reference supporting guidelines and policies that describe specific management practices.

Indicator 7.1.g The management plan describes insects and diseases, current or anticipated outbreaks on forest conditions and management goals, and how insects and diseases will be managed (see Criteria 6.6 and 6.8).

FF Indicator 7.1.g Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Intent: Disease may include biotic factors (e.g., fungi and other pathogens) and abiotic factors (e.g., acidic deposition).

Guidance: Potential impacts on stocking or harvest are described.

The management plan may reference supporting guidelines and policies that describe specific management practices.

This description is commensurate with the likelihood of outbreaks or infestations.

Indicator 7.1.h If chemicals are used, the plan describes what is being used, applications, and how the management system conforms with Criterion 6.6.

FF Indicator 7.1.h Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.i If biological controls are used, the management plan describes what is being used, applications, and how the management system conforms with Criterion 6.8.

FF Indicator 7.1.i Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.j The management plan incorporates the results of the evaluation of social impacts, including:

- traditional cultural resources and rights of use (see Criterion 2.1);
- potential conflicts with customary uses and use rights (see Criteria 2.2, 2.3, 3.2);
- management of ceremonial, archeological, and historic sites (see Criteria 3.3 and 4.5);
- management of aesthetic values (see Indicator 4.4.a);
- public access to and use of the forest, and other recreation issues;
- local and regional socioeconomic conditions and economic opportunities, including creation and/or maintenance of quality jobs (see Indicators 4.1.b and 4.4.a), local purchasing opportunities (see Indicator 4.1.e), and participation in local development opportunities (see Indicator 4.1.g).

FF Indicator 7.1.j Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.k The management plan describes the general purpose, condition and maintenance needs of the transportation network (see Indicator 6.5.e).

FF Indicator 7.1.k Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Intent: The transportation network includes roads, skid trails, landings, and stream crossings. Management needs include maintenance, upgrades, closures, etc.

Indicator 7.1.l The management plan describes the silvicultural and other management systems used and how they will sustain, over the long term, forest ecosystems present on the FMU.

FF Indicator 7.1.l Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.m The management plan describes how species selection and harvest rate calculations were developed to meet the requirements of Criterion 5.6.

FF Indicator 7.1.m Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Intent: “species selection” refers to species selected to harvest, retain, and promote regeneration.

Guidance: The plan describes the methods used to calculate the harvest level, and describes how that level is consistent with the composition, structures, and functions of the FMU in accordance with Criterion 6.3 and other applicable Criteria.

Indicator 7.1.n The management plan includes a description of monitoring procedures necessary to address the requirements of Criterion 8.2.

FF Indicator 7.1.n Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.o The management plan includes maps describing the resource base, the characteristics of general management zones, special management areas, and protected areas at a level of detail to achieve management objectives and protect sensitive sites.

Guidance: Depending on the map scale (e.g. forest level vs. stand level) and purpose and intensity of management, maps should include:

1. property boundaries and ownership;
2. roads and trails;
3. planned management activities including forest product harvest areas;
4. forest types by age class;
5. topography, soils, water courses and water bodies;
6. wetlands and riparian zones;
7. archeological and cultural sites and customary use areas;
8. locations of unique and sensitive natural communities, habitats and features;
9. rare, threatened and endangered species;
10. Representative Sample Areas, and
11. designated protected areas and High Conservation Value Forests.

The location of sensitive sites (e.g. rare plants or archaeological sites) need not be made publicly available to protect the resource.

FF Indicator 7.1.o Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.p The management plan describes and justifies the types and sizes of harvesting machinery and techniques employed on the FMU to minimize or limit impacts to the resource.

Guidance: The landowner or manager provides rationale for the types of equipment used in different situations. Where they are not legally allowed to restrict the type of equipment (e.g., some state harvesting contracting requirements), the plan describes how different types of equipment are selected.

FF Indicator 7.1.p Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.q Plans for harvesting and other significant site-disturbing management activities required to carry out the management plan are prepared prior to implementation. Plans clearly describe the activity, the relationship to objectives, outcomes, any necessary environmental safeguards, health and safety measures, and include maps of adequate detail.

Intent: This Indicator ensures that potential impacts and outcomes of site specific activities are addressed in a way that reflects the intent of a more general (not site-specific) management plan.

Desired outcomes include both the immediate post-activity condition (e.g., stocking and composition) and desired longer-term outcomes (e.g., regeneration).

Other significant site disturbing management activities may include, but are not limited to: site preparation, prescribed burns, use of chemicals or biological control agents, and road building or significant road maintenance.

Guidance: Operation plans may be integrated into the management plan (more likely on small ownerships) or be a separate document prior to the activity (e.g., a form or narrative, with associated map).

Harvest activity descriptions include the silvicultural system and specific practice, and desired post-harvest condition and other outcomes (e.g. regeneration).

This Indicator may be addressed with a combination of documents, such as contracts, maps, BMPs, and pre-harvest checklists.

For public lands, plans should be made available to the public prior to commencement of significant operations. The land manager should address public comments as part of the process of revising the plans.

FF Indicator 7.1.q Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

Indicator 7.1.r The management plan describes the stakeholder consultation process.

FF Indicator 7.1.r Inapplicable. All requirements have been incorporated into Family Forest Indicator 7.1.a.

C7.2 The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

Intent: Elements of Criterion 7.2 are elaborated upon more fully under the related Indicators of Principle 8. This Criterion is closely related to Criterion 8.4 which requires that monitoring results be incorporated into the management plan.

Indicator 7.2.a The management plan is kept up to date. It is reviewed on an ongoing basis and is updated whenever necessary to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances. At a minimum, a full revision occurs every 10 years.

Intent: The rigor of the review and update is contingent upon scale and intensity of management, and updates should focus on those aspects of the plan where changes are necessary.

It is not the intent that a hard-copy management plan is re-written every time there is a harvest or a natural disturbance (wildfire or pest infestation) on some part of the FMU. When the impact is large enough to require changes in management strategy, it may require revision of specific parts of the management plan.

Reasons for modifying the management plan may include but are not limited to: (1) in response to, and to incorporate, the results of monitoring as outlined in Principle 8; (2) whenever changes are proposed to the plan's primary objectives or management system; (3) whenever a significant environmental impact, threat or natural disturbance occurs; (4) whenever significant changes in uses of the FMU occur; (5) when there are significant changes in socio-economic circumstances.

The management system may incorporate ongoing and dynamic processes or data such as GIS.

C7.3 Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plan.

Indicator 7.3.a Workers are qualified to properly implement the management plan; all forest workers are provided with sufficient guidance and supervision to adequately implement their respective components of the plan.

Guidance: Adequate training and supervision measures may include but are not limited to: employers actively train employees in the goals and requirements of this and other applicable FSC standards; loggers and other operators participate in informal and formal training, such as Forest Industry Safety Training Alliance, Game of Logging and similar programs; professional foresters and resource managers meet continuing education standards, such as Society of American Foresters 'Certified Forester' program; foresters, loggers, and other relevant employees are trained to understand SMZ, RMZ, rare species, and HC VF forest protection requirements for the forest, as well as safeguards relating to chemical applications; field personnel are provided with written harvest plans and/or maps that clearly guide actions required to implement the management plan; and meetings occur as needed to review operations and make any necessary adjustments.

C7.4 While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

Intent: The owner or manager of a private forest may withhold proprietary information (e.g., timber volumes by size and age class, marketing strategies, and other financial information, see Criterion 8.5) but is required to share information from the plan that informs stakeholders of management activities and implementation of the Principles, Criteria and Indicators found in this Standard.

Indicator 7.4.a While respecting landowner confidentiality, the management plan or a management plan summary that outlines the elements of the plan described in Criterion 7.1 is available to the public either at no charge or a nominal fee.

Guidance: See Criterion 8.5 for more information on respecting landowner confidentiality and what is acceptable to provide in a public summary. Limited elements of the plan may be excluded to protect the security of environmentally sensitive and/or proprietary information.

When possible, the forest owner/manager should post a summary of the management plan on their website, but at a minimum this summary is made available upon request.

Indicator 7.4.b Managers of public forests make draft management plans, revisions and supporting documentation easily accessible for public review and comment prior to their implementation. Managers address public comments and modify the plans to ensure compliance with this Standard.

Applicability: this Indicator is applicable only to public forests.