# Guidance for Riparian Management Zones under FSC

## *Meeting Forest Stewardship Council requirements*

Forest Stewardship Council® (FSC®) certification entails following rigorous criteria when carrying out active forest management practices. FSC's goal is for forest management to maximize positive environmental benefits while minimizing adverse environmental impacts. Fundamental to this goal is maintaining the ecological functions and resilience of forest ecosystems by taking a precautionary approach that conserves biological diversity, water resources, soils, and unique and fragile ecosystems.

Riparian zones are those areas at the interface between land and water. They have great ecological importance as they are areas of high biodiversity, serve as migratory corridors for wildlife, protect water quality, and are fish habitat. Five important ecological functions are often attributed to the health of forested riparian areas:

- **Sediment filtration.** Vegetation traps sediment from upland areas, reducing its input to surface water.
- **Bank stability.** Roots of trees, shrubs and groundcovers hold soil together along streambanks, minimizing the potential for erosion, and excessive sediment delivery to streams.
- **Shade.** The canopies of trees and shrubs minimize the amount of sunlight reaching surface water, thereby keeping water cool.
- **Nutrient input.** Leaves, branches and other organic matter from vegetation in riparian areas provides a source of food for many aquatic species. Further, insects attracted to riparian vegetation often become food for fish and other aquatic life.
- **Large woody debris input.** Large trees along streams and wetlands provide important habitat structure when they fall and interact with aquatic system. Pools and riffles form around in-stream logs, wood provides shade, and debris can slow water velocity and trap sediment, minimizing stream channel erosion.

This document covers the following topics:

- **Summary of minimum riparian buffer standards**
- **Detailed description of FSC guidance for riparian zone management**
- **Comparison of riparian buffer standards**
- **Appendix: Principle 6: Environmental Impact - *excerpt from FSC-US Forest Management Standard***

# 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 FSC requirements are superseded when and where state or federal laws, regulations, or other contractual requirements are more stringent.*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 |
|---|---|
| • Fish bearing stream – Type F or S<br>• Shorelines<br>• Lakes & wetlands >1 acre | Minimum riparian management zone width: 150 foot<br>50 foot inner zone<br>100 foot outer zone<br>• Single-tree selection in inner zone<br>• No equipment in inner zone<br>• Single & group tree selection in outer zone |
| • Non-fish bearing stream, perennial | Minimum riparian management zone width: 100 foot<br>25 foot inner zone<br>75 foot outer zone<br>• Single tree selection in inner zone<br>• Single & group tree selection in outer zone |
| • Non-fish bearing stream, seasonal. Supports aquatic species.<br>• Lakes & wetlands <1 acre | Minimum riparian management zone width: 75 foot<br>• Single-tree or group selection |
| • Non-fish bearing stream, seasonal. Does not support aquatic species | No prescribed buffer width<br>Management must:<br>• Maintains root strength and stream bank and channel stability<br>• 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.*

# Detailed description of FSC guidance for riparian zone management

*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 no support aquatic species, management:**
    - maintains root strength and stream bank and channel stability
    - recruits coarse wood to the stream system
    - minimizes management-related sediment transport to the stream system

# Comparison of riparian forest buffer standards

*This table is for general reference only. FSC, OR, and WA each have different requirements and slightly different definitions. Each state's buffer requirements can vary from those described below depending on geographic region, stream width, acreage owned, approved alternate plans, etc. Work with your local state practices forester and/or consulting forester to establish buffers. If you or your consultant have questions, NNRG encourages you to contact us in advance during your harvest planning. FSC requirements noted below are the minimum buffer standards and are superseded when and where state or federal laws, regulations, or other contractual requirements are more stringent.*

| **Stream Type** | **Buffer Type** | **FSC-US** Slope distance | **Oregon** | | | **Washington** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Pacific Coast | Stream Size | | | Site Class *ex. western WA streams >10 feet* | | | |
| **Type S (WA)** | | | SM | MD | LG | I | II | III | IV |
| **Type F (OR & WA)** | | | | | | | | | |
| **Wetlands >1 acre** | core | -- | 20 foot | 20 foot | 20 foot | 50 foot | 50 foot | 50 foot | 50 foot |
| *Fish-bearing* | inner | 50 foot | 30 foot | 50 foot | 80 foot | 100 foot | 78 foot | 55 foot | 33 foot |
| FSC category A | outer | 100 foot | -- | -- | -- | 50 foot | 42 foot | 35 foot | 27 foot |
| stream | **total** | **150 foot** | **50 foot** | **70 foot** | **100 foot** | **200 foot** | **170 foot** | **140 foot** | **110 foot** |
| **Type SSBT (OR)** | | | SM | MD | LG | **Not a stream type classification in WA.** | | | |
| *Salmon, steelhead, bull trout* | core | -- | 20 foot | 20 foot | -- | | | | |
| | inner | 50 foot | 20 foot | 30 foot | -- | | | | |
| FSC category A | outer | 100 foot | 20 foot | 30 foot | -- | | | | |
| stream | **total** | **150 foot** | **60 foot** | **80 foot** | -- | | | | |
| **Type D (OR)** | | | SM | MD | LG | **Not a stream type classification in WA.** | | | |
| *Non-fish, domestic water* | core | -- | 20 foot | 20 foot | 20 foot | | | | |
| *Non-fish, not used as domestic water* | inner | 25 foot | -- | 30 foot | 50 foot | | | | |
| | outer | 75 foot | -- | -- | -- | | | | |
| FSC category B stream | **total** | **100 foot** | **20 foot** | **50 foot** | **70 foot** | | | | |
| **Type N (OR)** | | | SM | MD | LG | I | II | III | IV |
| **Type Np (WA)** | | | | | | | | | |
| *Non-fish, perennial.* | core | -- | 0 foot | 20 foot | 20 foot | 50 foot | 50 foot | 50 foot | 50 foot |
| *Non-fish, not used as domestic water* | inner | 25 foot | 0 foot | 30 foot | 50 foot | -- | -- | -- | -- |
| | outer | 75 foot | -- | -- | -- | -- | -- | -- | -- |
| | **total** | **100 foot** | **0 foot** | **50 foot** | **70 foot** | **50 foot** | **50 foot** | **50 foot** | **50 foot** |
| FSC category B stream | | | | | | *+30 foot equipment limitation zone* | | | |
| **Type Ns (WA)** | | | **Not a stream type classification in OR.** | | | I | II | III | IV |
| **Wetlands <1 acre** | | | | | | | | | |
| *Non-fish, seasonal. Supports aquatic species* | core | -- | | | | -- | -- | -- | -- |
| | inner | -- | | | | -- | -- | -- | -- |
| | outer | 75 foot | | | | -- | -- | -- | -- |
| | **total** | **75 foot** | | | | **0 foot** | **0 foot** | **0 foot** | **0 foot** |
| FSC category C stream | | | | | | *+30 foot equipment limitation zone* | | | |
| **Type Ns (WA)** | | No prescribed buffer width | **Not a stream type classification in OR.** | | | I | II | III | IV |
| *Non-fish, seasonal. Does not support aquatic species* | | | | | | -- | -- | -- | -- |
| | | | | | | -- | -- | -- | -- |
| | | | | | | -- | -- | -- | -- |
| FSC category D stream | | | | | | **0 foot** | **0 foot** | **0 foot** | **0 foot** |
| | | | | | | *+30 foot equipment limitation zone* | | | |

**References**


- Forest Stewardship Council US Forest Management Standard v1.0 https://us.fsc.org/download.fsc-us-forest-management-standard-v1-0.95.htm
- Oregon's Forest Protection Laws https://oregonforests.org/sites/default/files/2018-02/OFRI_IllusManual_full.pdf
- Washington State Department of Natural Resources Forest Practices Illustrated https://www.dnr.wa.gov/publications/fp_fpi_complete.pdf

# Appendix: FSC indicators for riparian management zone protections

*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 6: Environmental Impact

**Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.**

Intent: Principle 6 focuses on maximizing positive environmental impacts and minimizing adverse environmental impacts from forest management operations: assessment of impacts, protection of species and communities, maintenance of ecological functions, the use of pesticides and forest conversion.

Within the scope of Principle 6 are issues and concepts about which there remains considerable uncertainty; in cases of uncertainty, the use of a ***precautionary approach*** is present both implicitly and explicitly in several aspects of the Principle because mitigation, repair and restoration is often difficult, more costly, and sometimes impossible.

See Glossary for definition of ***biological diversity.***

**Criterion 6.3 Ecological functions and values shall be maintained intact, enhanced, or restored, including:**

- **a) Forest regeneration and succession.**
- **b) Genetic, species, and ecosystem diversity.**
- **c) Natural cycles that affect the productivity of the forest ecosystem.**

**Indicator 6.3.c** Management maintains, enhances and/or restores the plant and wildlife habitat of ***Riparian Management Zones (RMZs)*** to provide:

a) habitat for aquatic species that breed in surrounding uplands;
b) habitat for predominantly terrestrial species that breed in adjacent ***aquatic habitats***;
c) habitat for species that use riparian areas for feeding, cover, and travel;
d) habitat for plant species associated with riparian areas; and,
e) stream shading and inputs of wood and leaf litter into the adjacent aquatic ecosystem.

Intent: This Indicator is intended to cover the habitat and functions of riparian zones around rivers, perennial and ***intermittent streams***, ponds, lakes, ***wetlands***, ***vernal pools*** and tidal waters.

Guidance: Depending on the ecosystem and region, ***riparian zones*** frequently extend beyond, and may have different management guidelines than, those required by Criterion 6.5. Management activities in the RMZ are acceptable as long as ecological objectives are met.

Aquatic species that breed in surrounding uplands include turtles and cavity-nesting ducks; terrestrial species that breed in aquatic habitats include some amphibians; species that use riparian areas for feeding, cover and travel include some birds, mammals, reptiles, amphibians and insects.

In general, it is expected that RMZs for habitat management will vary in width with ecological importance and with the intensity of timber harvest adjacent to the RMZ. The forest owner/manager may use ecologically appropriate guidelines such as those that are available in some states or regions, or other approaches (e.g., focal species) to determine RMZ width and characteristics. Flexibility rather than uniform RMZ widths is appropriate if based on scientifically based outcomes that maintain or restore ecological function.

**Indicator 6.5.e.1** In consultation with appropriate expertise, the forest owner or manager implements written ***Streamside Management Zone*** (SMZ) ***buffer*** management guidelines that are adequate for preventing environmental impact, and include protecting and restoring water quality, hydrologic conditions in rivers and stream corridors, wetlands, vernal pools, seeps and springs, lake and pond shorelines, and other hydrologically sensitive areas. The guidelines include vegetative buffer widths and protection measures that are acceptable within those buffers.

In the Appalachia, Ozark-Ouachita, Southeast, Mississippi Alluvial Valley, Southwest, Rocky Mountain, and Pacific Coast regions, there are requirements for minimum SMZ widths and explicit limitations on the activities that can occur within those SMZs. These are outlined as requirements in Appendix E.

Intent: The focus of this Indicator is on stream and water quality protection, and also involves riparian management zones and stream management zones. See Indicator 6.3.d for requirements addressing plant and wildlife habitat values adjacent to water bodies.

Guidance: Guidelines should meet or exceed regional recommendations (e.g., water quality BMPs) as necessary to meet the objective of water quality protection and restoration measures. Measures for all stream segments include, but are not limited to:

- developing buffer widths sufficient to protect and restore water quality, considering: temperature, sedimentation, chemical runoff, recruitment of woody debris and stream structure, and the timing of water flows sufficient to meet water quality standards for both humans and aquatic species, including invertebrates, fish, and amphibians;
- providing filter strips that vary with slope and soils that are sufficient to trap sediment from upslope sites;
- minimizing soil disturbance;
- providing adequate shade to protect water temperature;
- minimizing or precluding harvest within core portions of buffer strips;
- protecting stream banks;
- maintaining tree cover and minimizing disturbance of floodplain areas to ensure that proper aquatic function will be provided when channels shift;
- ensuring recruitment of coarse woody debris where needed for aquatic habitats;
- regulating harvest and road construction on upslope areas to ensure proper hydrological function, including the timing, intensity, and location of water delivery.

**Indicator 6.5.e.2** Minor variations from the stated minimum SMZ widths and layout for specific stream segments, wetlands and other water bodies are permitted in limited circumstances, provided the forest owner or manager demonstrates that the alternative configuration maintains the overall extent of the buffers and provides equivalent or greater environmental protection than FSC-US regional requirements for those stream segments, water quality, and aquatic species, based on site-specific conditions and the best available information. The forest owner or manager develops a written set of supporting information including a description of the riparian habitats and species addressed in the alternative configuration. The CB must verify that the variations meet these requirements, based on the input of an independent expert in aquatic ecology or closely related field.

Intent: This Indicator allows for minor variations in the physical layout of the buffers for specific stream segments in cases where the landowner/manager must also comply with legal requirements that compel layouts different than those specified in the Standard, without reducing the overall extent of the buffer and quality of management within the buffer for those stream segments.

## Appendix E: PACIFIC COAST REGION

*PC Applicability note: The following water quality requirements of this Standard are superseded when and where state or federal laws, regulations, or other contractual requirements are more stringent.*

*PC Guidance: This section uses the following 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*

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

6.5.e.1.a (PC only) For Category A streams, and for lakes and wetlands larger than one acre, an inner buffer zone is maintained. The inner buffer is at least 50 feet 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.

Management activities in the inner buffer:

- maintains or restore the native vegetation
- are limited to single-tree selection silviculture
- retain and allows for recruitment of large live and dead trees for shade and stream structure
- 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
- exclude use of heavy equipment, except to cross streams at designated places, or where the use of such equipment is the lowest impact alternative
- avoid disturbance of mineral soil; where disturbance is unavoidable, mulch and seed are applied before the rainy season
- avoid the spread of pathogens and noxious weeds
- avoid road construction and reconstruction.

6.5.e.1.b (PC only) For Category A 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 feet from the edge of the active high water mark (slope distance, on both sides) of the stream channel. In this outer buffer, harvest occurs only where:

- single-tree or group selection silviculture is used
- 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
- new road construction is avoided and reconstruction enhances riparian functions and reduces sedimentation;
- disturbance of mineral soil is avoided; where disturbance is unavoidable, mulch and seed are applied before the rainy season

6.5.e.1.c (PC only) For Category B streams, a 25-foot (slope distance) inner buffer is created and managed according to provisions for inner buffers for Category A. 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 Category A.

6.5.e.1.d (PC only) For Category C streams, 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 Category A streams.

6.5.e.1.e (PC only) For Category D streams, management:

- maintains root strength and stream bank and channel stability
- recruits coarse wood to the stream system
- minimizes management-related sediment transport to the stream system.

Streams, vernal pools, lakes, wetlands, seeps, springs, and associated riparian areas are managed to maintain and/or restore hydrologic processes, water quality, and habitat characteristics (see NMFS (1996); state water quality standards; Karr (1981) which may include: the capacity for water to infiltrate the soil; habitat for riparian species; moderating water temperature; controlling sedimentation; clean gravel for spawning; physical structures to protect the integrity of the stream channel; including pools used by anadromous fish.

Forest owners or managers 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.