Trail Fundamentals

Trail Fundamentals are five concepts that are the cornerstones of U.S. Department of Agriculture, Forest Service, trail management:

- Trail Type*
- Trail Class*
- Managed Use*
- Designed Use*
- Design Parameters

Identify the five Trail Fundamentals for each National Forest System (NFS) trail or trail segment based on applicable land management plan direction, travel management decisions, trail-specific decisions, and other related direction (FSM 2353.13).

Trail Fundamentals provide an integrated means to consistently record and communicate the intended design and management guidelines for trail design, construction, maintenance and use. Before completing documentation for Trail Management Objectives (TMO), Trail Assessment and Condition Surveys (TRACS), or applying Trail Fundamentals in trail management, it is essential to clearly understand their intent.

Trail Type (Forest Service Handbook [FSH] 2309.18, Section 14.1)

The Trail Type is a category that reflects the predominant trail surface and general mode of travel accommodated by a trail.

There are three Trail Types (FSH 2353.05):

- **Standard/Terra Trail**—A trail that has a surface consisting predominantly of the ground and that is designed and managed to accommodate use on that surface.
- **Snow Trail**—A trail that has a surface consisting predominantly of snow or ice and that is designed and managed to accommodate use on that surface.
- **Water Trail**—A trail that has a surface consisting predominantly of water (but may include land-based portages) and that is designed and managed to accommodate use on that surface.

This management concept allows managers to identify trail-specific Design Parameters, management needs, and the cost of managing the trail for particular uses and/or seasons by trail or trail segment.

1. Inventory trails and identify the appropriate Design Parameters, management needs, and management costs for NFS trails using the Trail Types.
2. Identify only one Trail Type per trail.
3. Identify the Trail Type for each NFS trail based on applicable land management plan direction, travel management decisions, trail-specific decisions, and other related direction.
4. Inventory both trails and Trail Types in the Infra Trails Module when two National Forest System trails overlap, for example, when a Snow Trail overlaps a Standard Terra Trail.

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*This management concept/attribute is included in the Federal Trail Data Standards, published by the Federal Geographic Data Committee, and developed by the U.S. Department of Agriculture, Forest Service, and Department of the Interior, National Park Service, Bureau of Land Management, and Fish and Wildlife Service.

Trail Class (FSH 2309.18, Section 14.2)

The Trail Class is the prescribed scale of development for a trail, representing its intended design and management standards.

Trail Classes are general categories reflecting trail development scale, arranged along a continuum.

There are five Trail Classes, ranging from the least developed (Trail Class 1) to the most developed (Trail Class 5):

- **Trail Class 1**—Minimally Developed
- **Trail Class 2**—Moderately Developed
- **Trail Class 3**—Developed
- **Trail Class 4**—Highly Developed
- **Trail Class 5**—Fully Developed

Use Trail Classes to inventory NFS trails and to identify the applicable Design Parameters and costs for meeting the National Quality Standards for Trails.

1. Identify only one Trail Class per trail or trail segment.
2. Trail Class descriptors reflect typical attributes of trails in each class. Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.
3. There is a direct relationship between Trail Class and Managed Uses (FSH 2309.18, Section 14.3): generally, one cannot be determined without consideration of the other.
4. Identify the appropriate Trail Class for each NFS trail or trail segment based on the management intent in the applicable land management plan, travel management decisions, trail-specific decisions, and other related direction. Apply the Trail Class that most closely reflects the management intent for the trail or trail segment, which may or may not reflect the current condition of the trail.
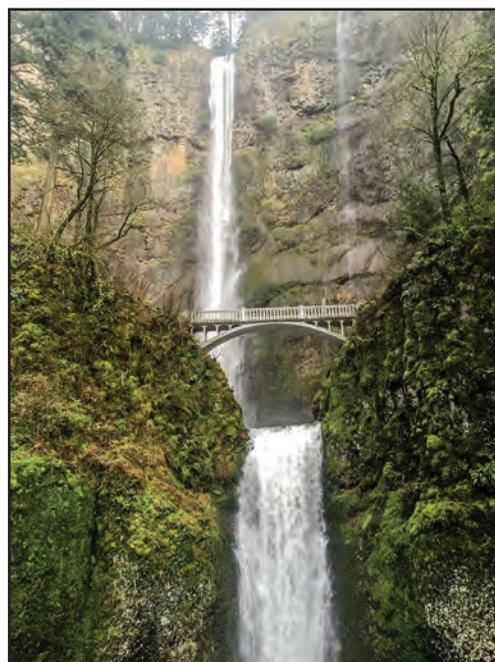
Multnomah Falls Trail, Oregon, in the Columbia River Gorge National Scenic Area is an iconic and well-known Class 4 trail.

For specifics on each Trail Class, refer to the Trail Class Matrix (FSH 2309.18, Section 14.2, Exhibit 01) on pages 33 and 34 and USFS Trail Class photo examples on pages 35 through 48 in this publication.

Managed Use (FSH 2309.18, Section 14.3)

Managed Use is a mode of travel that is actively managed and appropriate on a trail, based on its design and management.

1. Managed Use indicates management intent to accommodate a specific use.
2. There can be more than one Managed Use per trail or trail segment.
3. The Managed Uses for a trail are usually a small subset of all the allowed uses on the trail, that is, uses that are allowed unless specifically prohibited. For example, on a trail that is closed to all motorized use but open to all non-motorized use, the Managed Uses could be Hiker/Pedestrian and Pack and Saddle. The allowed uses, however, would also include bicycles and all other non-motorized uses.
4. Identify the Managed Uses for each NFS trail or trail segment based on applicable land management plan direction, travel management decisions, trail-specific decisions, and other related direction.
5. There is a direct relationship between Managed Use and Trail Class: generally, one cannot be determined without consideration of the other. Not all Trail Classes are appropriate for all Managed Uses. For guidance on the potential appropriateness of each Trail Class to each Managed Use, see FSH 2309.18, Section 14.3, Exhibit 01.

Designed Use (FSH 2309.18, Section 14.4)

Designed Use is the single Managed Use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable Trail Class, determines which Design Parameters will apply to a trail.

1. There is only one Designed Use per trail or trail segment. Although a trail or trail segment may have more than one Managed Use and numerous uses may be allowed, only one Managed Use is identified as the design driver or Designed Use.
2. Determine the Designed Use for a trail or trail segment from the Managed Uses identified for that trail. When making this determination, consider all Managed Uses that occur during all seasons of use of the trail or trail segment. Assess any essential or limiting geometry for the Managed Uses of the trail or trail segment to determine whether any trail-specific adjustments are necessary to the applicable Design Parameters.

    a. In some situations, when there is more than one Managed Use identified for a trail, the Designed Use may be readily apparent. For example, on a trail with Managed Uses of all-terrain vehicle and motorcycle, all-terrain vehicle use would be the Designed Use because this use requires wider tread widths and has lower tolerances for surface obstacles and maximum trail grades.
    b. In other situations involving more than one Managed Use, the Designed Use may not be readily apparent, as is often the case when there are fewer differences between the applicable sets of Design Parameters than in the example above. For example, on a trail that is actively managed for hiker and pedestrian, pack and saddle, and bicycle use, pack and saddle use would likely be the Designed Use because of the three Managed Uses, pack and saddle use generally has the most limiting design requirements. While the Bicycle Design Parameters are very similar to the Pack and Saddle Design Parameters, the Design Parameters for this trail may need to be adjusted to accommodate bicycles.

Managed Use and Designed Use Types

- Hiker/Pedestrian
- Pack and Saddle
- Bicycle
- Motorcycle
- All-Terrain Vehicle
- Four-Wheel Drive Vehicle > 50 Inches in Width
- Cross-Country Ski
- Snowshoe
- Snowmobile
- Motorized Watercraft
- Nonmotorized Watercraft

Design Parameters (FSH 2309.18, Section 14.5)

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of a trail, based on its Designed Use and Trail Class.

1. Design Parameters reflect the design objectives for NFS trails and determine the dominant physical criteria that most define their geometric shape. These criteria include:

    a. **Design Tread Width—**Design Tread Width is expressed in terms of single lane, double lane, and the minimum tread width on trail structures.
    b. **Design Surface—**Design Surface is expressed in terms of surface type, protrusions, and obstacles.
    c. **Design Grade—**Design Grade is expressed in terms of Target Grade, Short Pitch Maximum Grade, and Maximum Pitch Density.
    d. **Design Cross Slope—**Design Cross Slope is expressed in terms of Target Cross Slope and Maximum Cross Slope.
    e. **Design Clearing—**Design Clearing is expressed in terms of width, height, and shoulder clearance.
    f. **Design Turns—**Design Turns are expressed in terms of the turning radius.

2. Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, and other factors (for example, mitigation of site-specific safety concerns and adjustments to accommodate other Managed Uses), provided that the deviations are consistent with the general intent of the applicable Trail Class.

3. Identify the Design Parameters for a NFS trail or trail segment based on its Trail Class and Designed Use. For a Design Parameter such as Design Tread Width, Design Clearing Width, and Design Turns that is expressed as a range of values, identify a specific value for each trail or trail segment.

For the complete set of Design Parameters, refer to FSH 2309.18, Section 23.11, Exhibit 01, through Section 23.33, Exhibit 01 and pages 49 through 66 of this publication.