<table>
<thead>
<tr>
<th>Trail Problem</th>
<th>Trail Impact</th>
<th>Trail deterioration</th>
<th>Trail degradation</th>
<th>Trail erosion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciative behavior</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trail proliferation</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
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<tr>
<td>Vegetation cover loss</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>or compositional change</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Soil compaction</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
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<tr>
<td>Trail widening</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Trail incision and soil loss</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

A classification of trail research terms based on the scope of trail problems included (Leung, Marion 1996)
1937 Aerial Photo of the College Woods Trails

(Fig. 11b) 1937 aerial photo without the 2002 trails overlaid.
## Trail Condition Classes

<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 0:</td>
<td>Trail barely distinguishable; no or minimal disturbance of vegetation and/or organic litter.</td>
</tr>
<tr>
<td>Class 1:</td>
<td>Trail distinguishable; slight loss of vegetation cover and/or minimal disturbance of organic litter.</td>
</tr>
<tr>
<td>Class 2:</td>
<td>Trail obvious; vegetation cover lost and/or organic litter pulverized in primary use area.</td>
</tr>
<tr>
<td>Class 3:</td>
<td>Vegetation cover lost and/or organic litter pulverized within the center of the tread, some bare soil exposed.</td>
</tr>
<tr>
<td>Class 4:</td>
<td>Nearly complete or total loss of vegetation cover and organic litter within the tread, bare soil widespread.</td>
</tr>
<tr>
<td>Class 5:</td>
<td>Soil erosion obvious, as indicated by exposed roots and rocks and/or gullying</td>
</tr>
</tbody>
</table>

(Fig. 3) Condition Class descriptions used to assess trail conditions
(Fig. 9) Layout of trail transect method used to calculate soil loss on Class 5 trail sections.

\[ A = \frac{V_1 + 2V_2 + \ldots + 2V_n + V_{n+1}}{2} \times L \]

Where:
- \( A \) = cross-sectional area
- \( V_1 - V_{n+1} \) = vertical distance measurements, starting \( V_1 \), the first fixed point, and ending at \( V_{n+1} \), the last vertical measurement taken.
- \( L \) = interval on horizontal altitude line.
(Fig. 21) Interrelationships between environmental, use related, and managerial factors affecting trail degradation.
(Fig. 22) Comparison of two sections of trail that both lie in the Yorktown Formation. The section of trail with a slope greater than 10 degrees has formed a gully, while the section of trail that has a slope of less than 5 degrees shows no sign of a gully.
(Fig. 23) The slope trail map overlaid on the condition class map shows the correlation between slope and class condition. As slope increases, class condition gets closer to class 5.
(Fig. 24) Slope trail map overlaid on the class condition. Class map shows that on the fitness trail where slope is less than 5 degrees, condition class tends to be class 3 or below.
(Fig. 25) Shows the location of where Loblolly Pine trees cove the trail and provide protection from trail users and rainfall.
(Fig. 26) The “Arm” has 0 users per hour and slopes greater than 10 degrees, but is class category 1. This suggests that frequency of use is a significant factor in controlling trial conditions.
Environmental Factors

- Climate
- Geology
- Topography
- Soil
- Vegetation

Use Related Factors

- User Type
- User Behavior
- Frequency of Use

Managerial Actions

Trail Condition

Key:
- Primary Factor
- Intermediate Factor
- Effect

(Fig. 21) Interrelationships between environmental, use related, and managerial factors affecting trail degradation.
Environmental Factors

Key:

- Primary Factor
- Intermediate Factor
- Effect
Findings

• Environmental factors are an important determinant of the type and severity of trail degradation.

  To illustrate, consider the college woods trails, which while receiving approximately the same type of use, exhibits segments in both good and poor condition.

• Trail degradation and vegetative changes are related to frequency of use and trail construction
User Hour

# of trail users / # of hours collecting data

Ex.

16 trail users / 4 hours in field
  = 4 user hours
(Fig. 12a) Percentage of main trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the main trail.
(Fig. 12b) Percentage of main trail has a slope of 0-5, 6-10, 11-15, and 16-30 degrees.
(Fig. 12c) Percentage of main trail that lies in the Yorktown, Sedley, Bacon’s Castle or Windsor formations.
(Fig. 12d) Observed trail use per hour of both foot and bike traffic each trail section.
(Fig. 13a) Percentage of secondary south trail that is class category 1, 2, 3, 4, or 5. There is no class 0 trails on the secondary trails.
(Fig. 13b) Percentage of secondary south trail that has a slope of 0-5, 6-10, 11-15, and 16-30 degrees.
(Fig. 13c) Percentage of secondary south trail that lies in the Yorktown, Sedley, Bacon’s Castle or Windsor formations.
(Fig. 13d) Observed trail use per hour of both foot and bike traffic for each trail section.
(Fig. 14a) Percentage of secondary north trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the secondary trails.
(Fig. 14b) Percentage of secondary north trail that lies in the Yorktown, Sedley, Bacon’s Castle or Windsor formations.
(Fig. 14c) Observed trail use per hour of both foot and bike traffic for each trail section.
(Fig. 15a) Percentage of fitness trail that is class category 1, 2, 3, 4, or 5. There is no class 0 trails on the fitness trails.
(Fig. 15b) Percentage of fitness trail that has a slope of 0-5, 6-10, 11-15, and 16-30 degrees.
(Fig. 15c) Percentage of secondary trail that lies in the Yorktown, Sedley, or Bacon’s Castle formations.
(Fig. 17a) Percentage of fitness trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the no “arm” fitness trails.
(Fig. 17b) Percentage of no “arm” fitness trail that has a slope of 0-5, 6-10, 11-15, and 16-30 degrees. 
(Fig. 17c) Percentage of no “arm” fitness trail that lies in the Yorktown, Sedley, or Bacon’s Castle formations.
Compare Trail Cross Section (ST-1)

Distance Across Trail (cm)

Depth (cm) — Depth2 (cm)

Number of Entries

Difference Graph ST-1
(Fig. 12e) Slope percentage of Main Trail Class Category 2.
(Fig. 12f) Slope percentage of Main Trail Class Category 3.
(Fig. 12g) Slope percentage of Main Trail Class Category 4.
(Fig. 12h) Slope percentage of Main Trail Class Category 5.
(Fig. 14e) Slope percentage of the Fitness Trail Class Category 2.
(Fig. 14f) Slope percentage of the Fitness Trail Class Category 3.
(Fig. 14g) Slope percentage of the Fitness Trail Class Category 4.
(Fig. 14h) Slope percentage of the Fitness Trail Class Category 5.
(Fig. 13e) Slope percentage of Secondary South Trail Class Category 2.
(Fig. 13f) Slope percentage of Secondary South Trail Class Category 3.
(Fig. 13g) Slope percentage of Secondary South Trail Class Category 4.
(Fig. 13h) Slope percentage of Secondary South Trail Class Category 5.