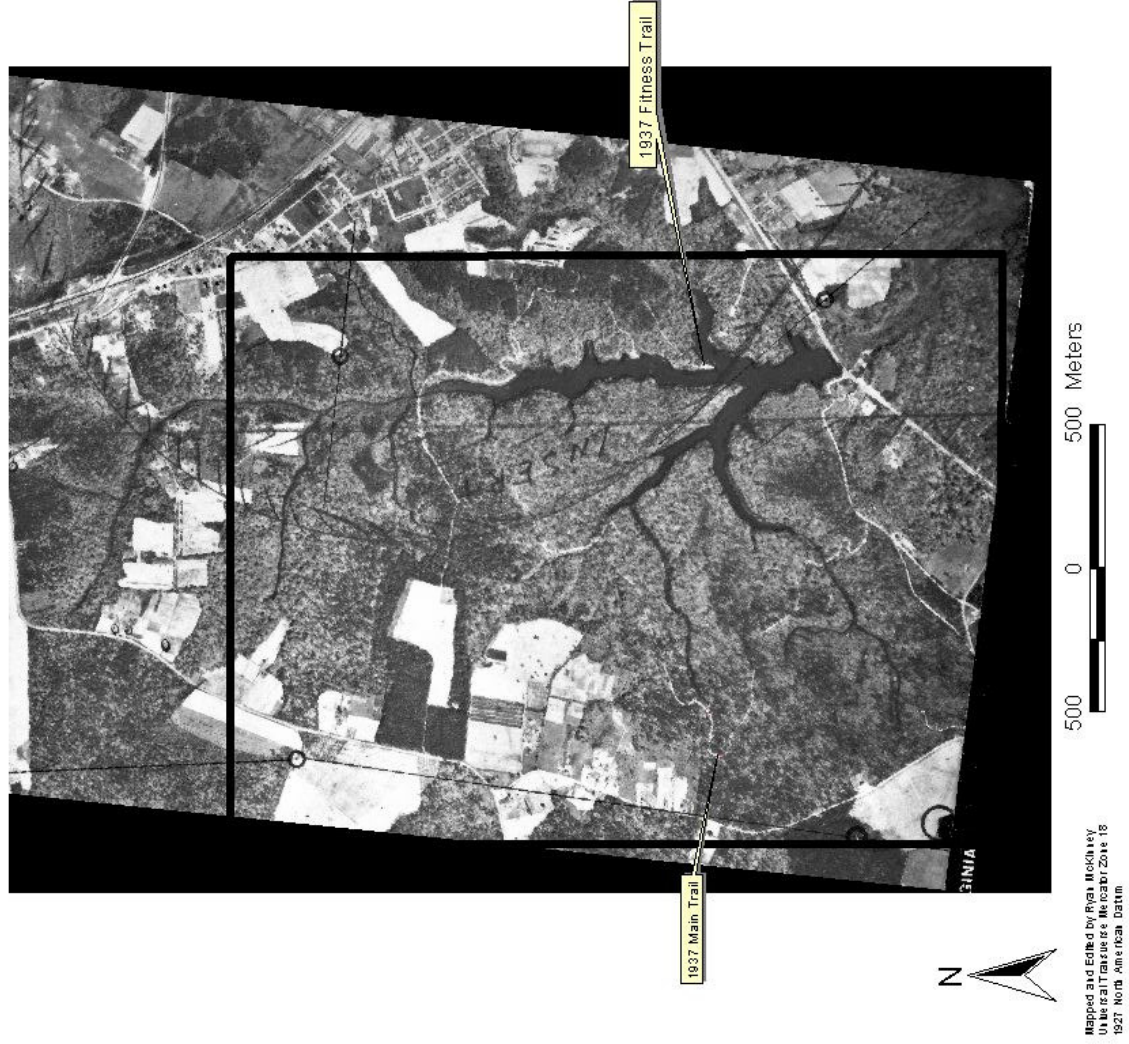


1928-1935

1970-1992

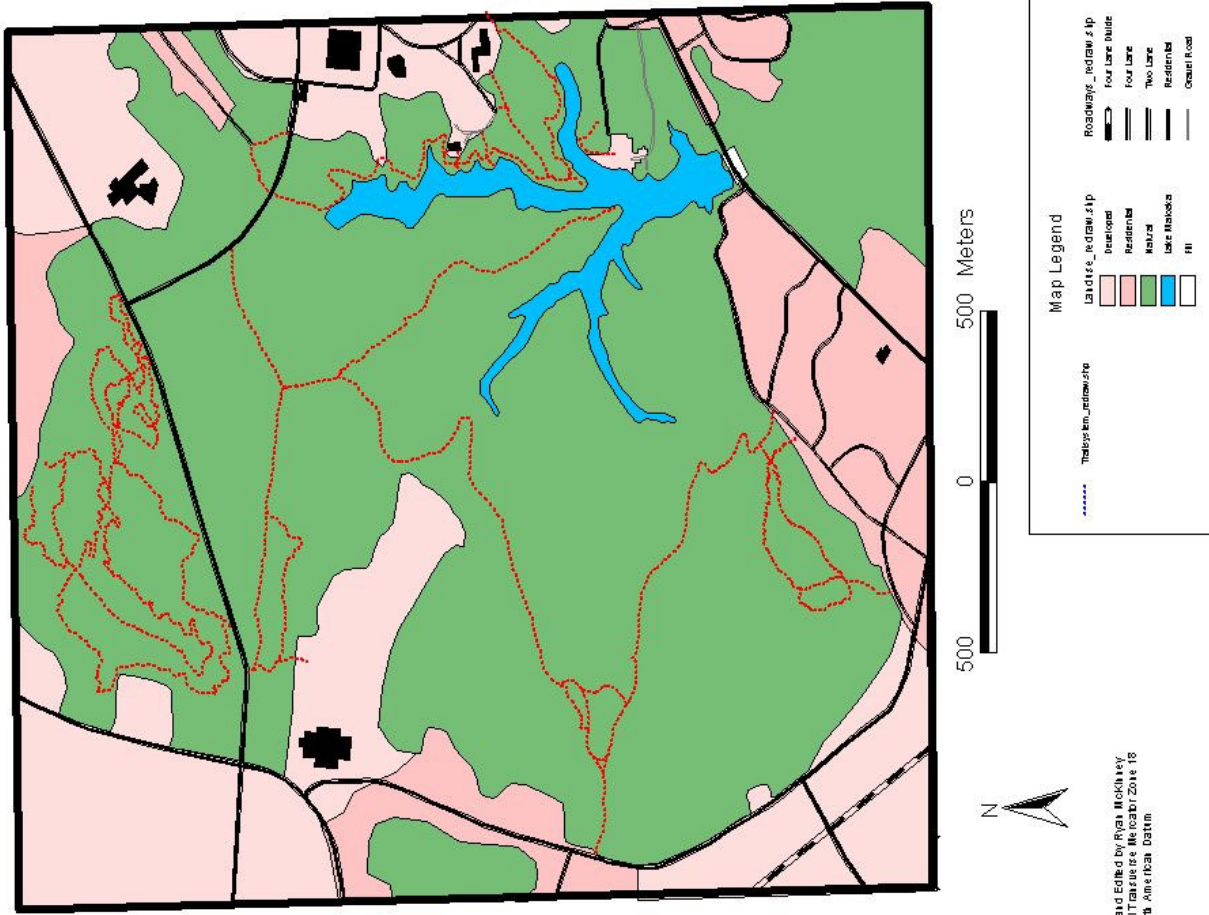
Trail Problem	Trail condition term			
	Trail Impact	Trail deterioration	Trail degredation	Trail erosion
Depreciative behavior	X			
Trail proliferation	X	X		
Vegetation cover loss or compositional change	X	X		
Soil compaction	X	X	X	
Trail widening	X	X	X	
Trail incision and soil loss	X	X	X	X
A classification 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.

Land Use In College Woods Area



Mapped and Edited by Ryan Wolkow
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 1927 North American Datum

Map Legend

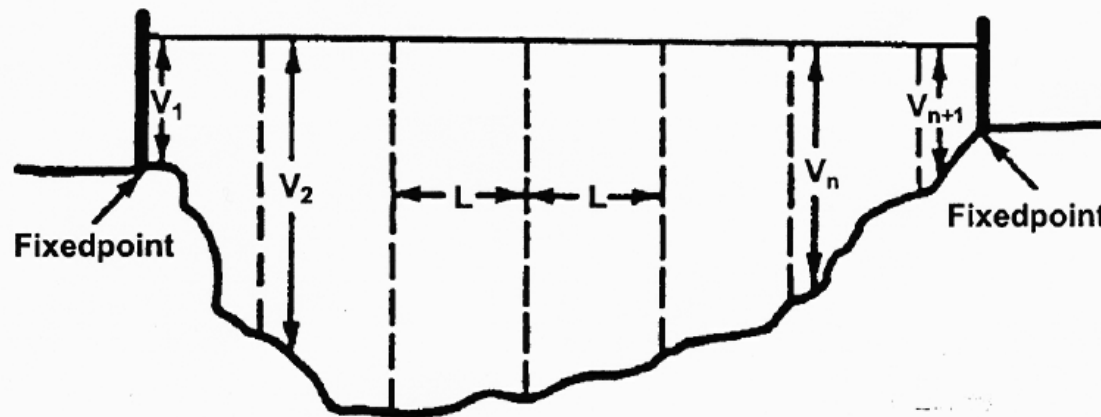
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	TrailSystem	Residential	Residential	Four Lane Blvd
	TrailSystem	Residential	Residential	Four Lane
	TrailSystem	Residential	Residential	Two Lane
	TrailSystem	Residential	Residential	Residential
	TrailSystem	Residential	Residential	Great Road

(Fig 7.) Land Use around College Woods Trail System.

Trail Condition Classes

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

(Fig. 3) Condition Class descriptions used to assess trail conditions



$$A = \frac{V_1 + 2V_2 + \dots + 2V_n + V_{n+1}}{2} \times L$$

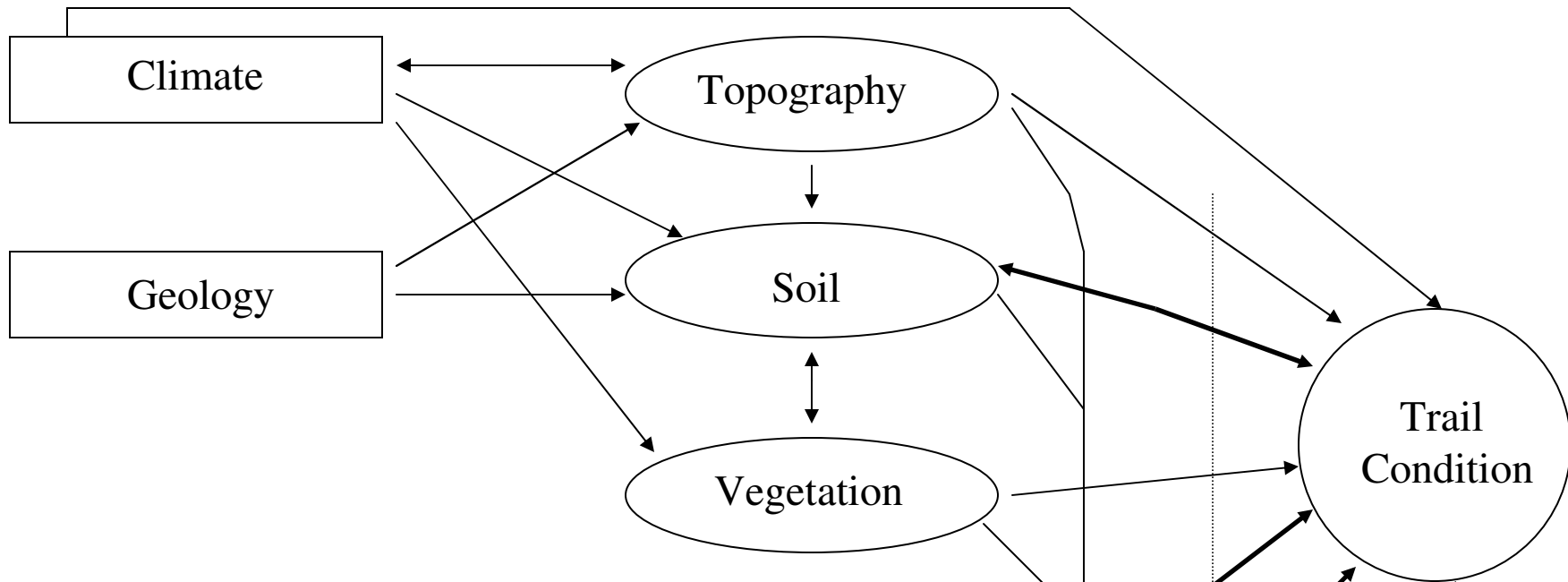
Where A = cross-sectional area

$V_1 - V_{n+1}$ = Vertical distance measurements, starting V_1 , the first fixed point, and ending at V_{n+1} , the last vertical measurement taken.

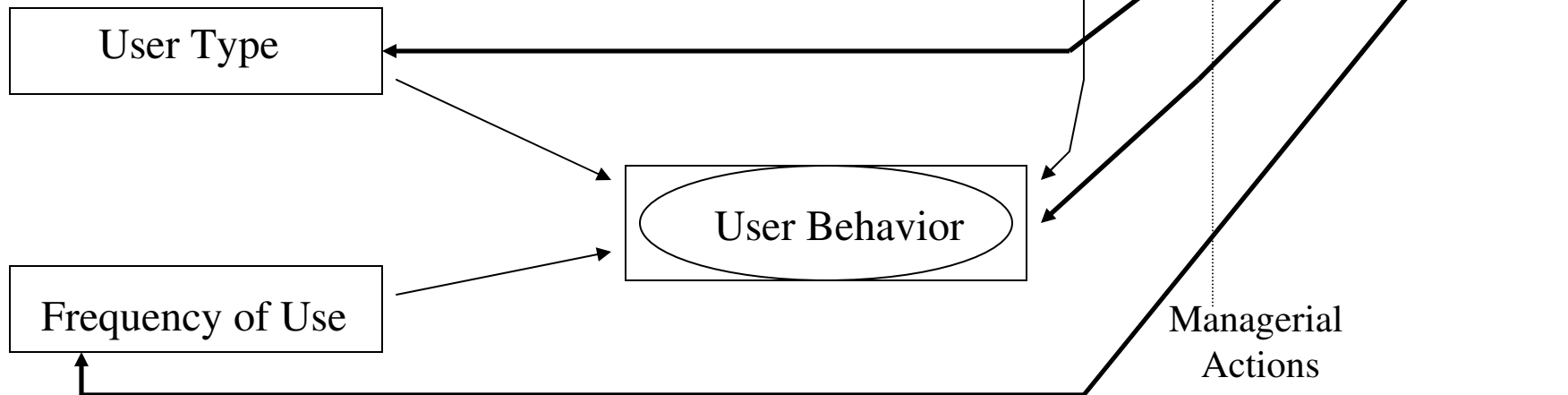
L = Interval on horizontal outline.

(Fig. 9) Layout of trail transect method used to calculate soil loss on Class 5 trail sections.

Environmental Factors



Use Related Factors

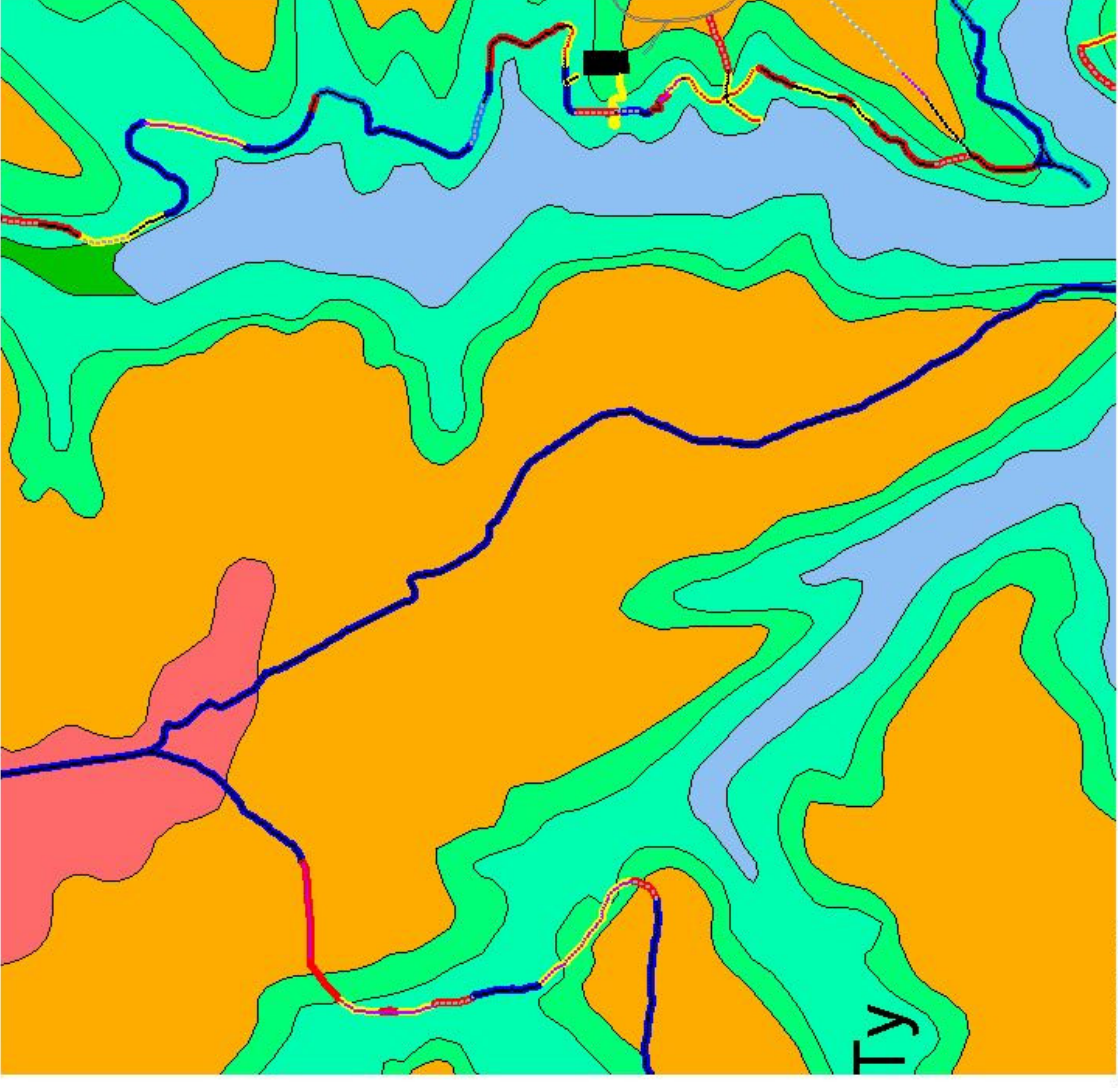


Key:

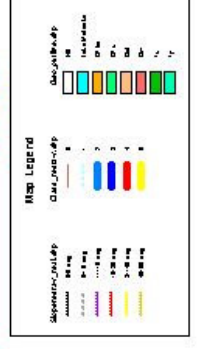


(Fig. 21) Inter relationships between environmental, use related, and managerial factors affecting trail degradation.

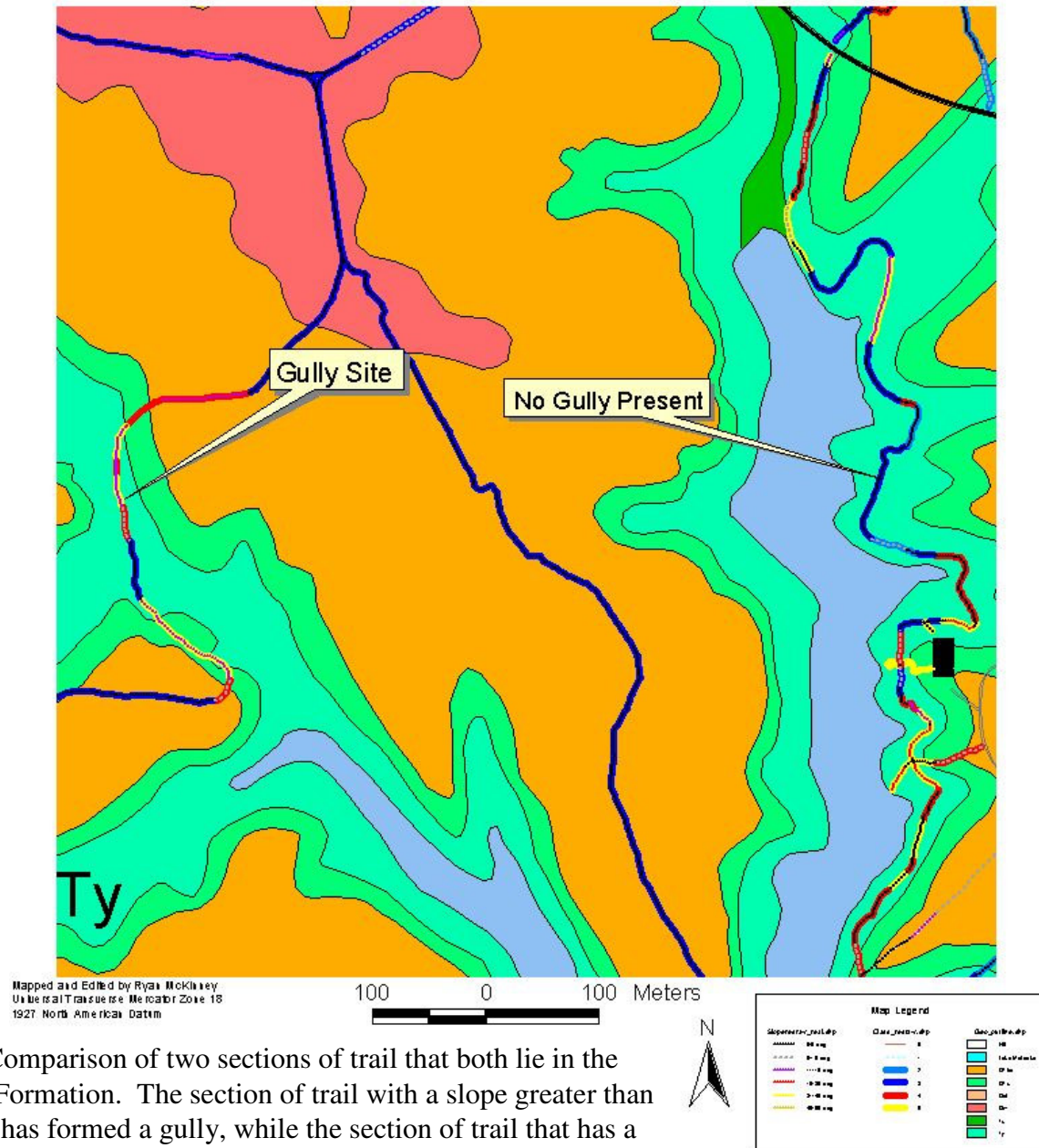
Map of Controlling Factors



Mapped and Edited by Ryan McKhaley
On the basis of the 1927 North American Datum

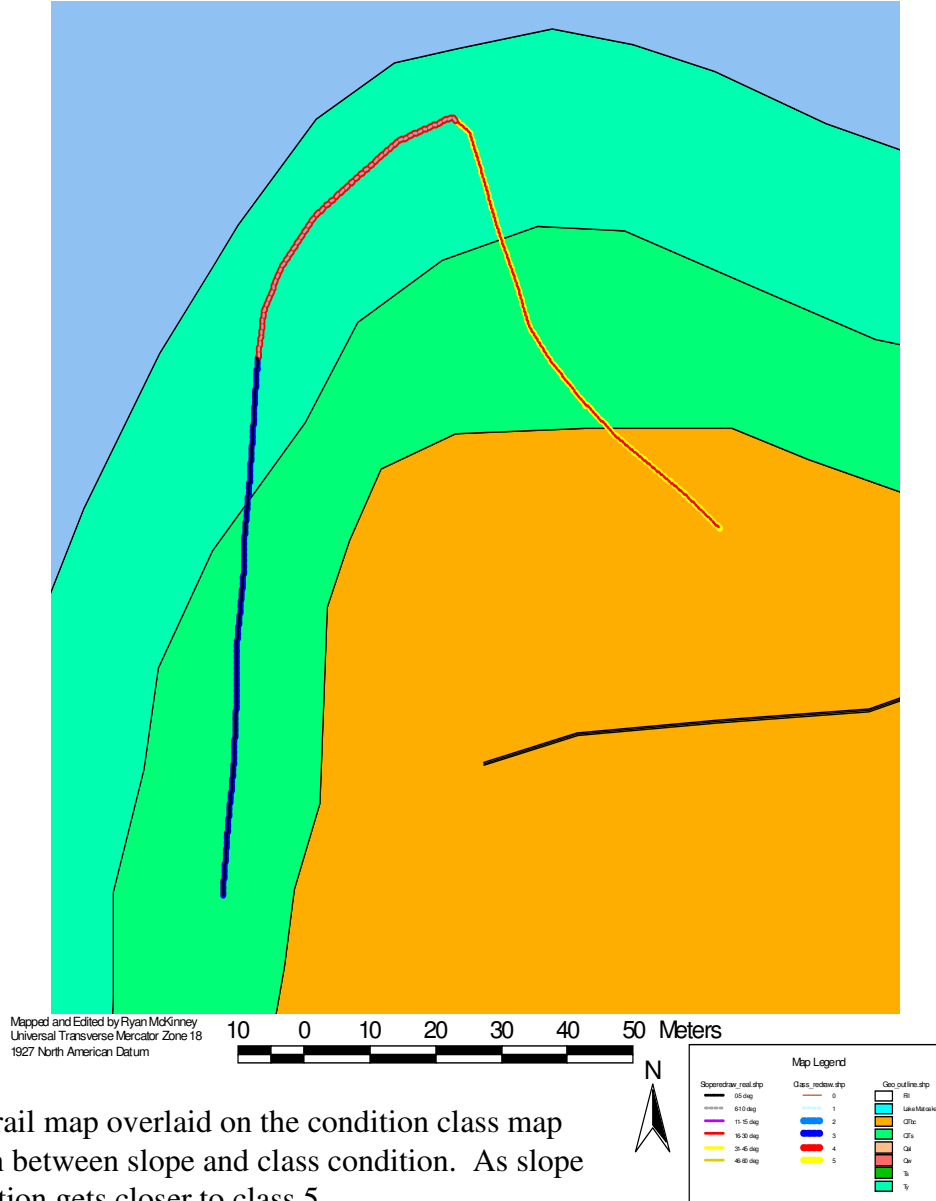


Gully Locations



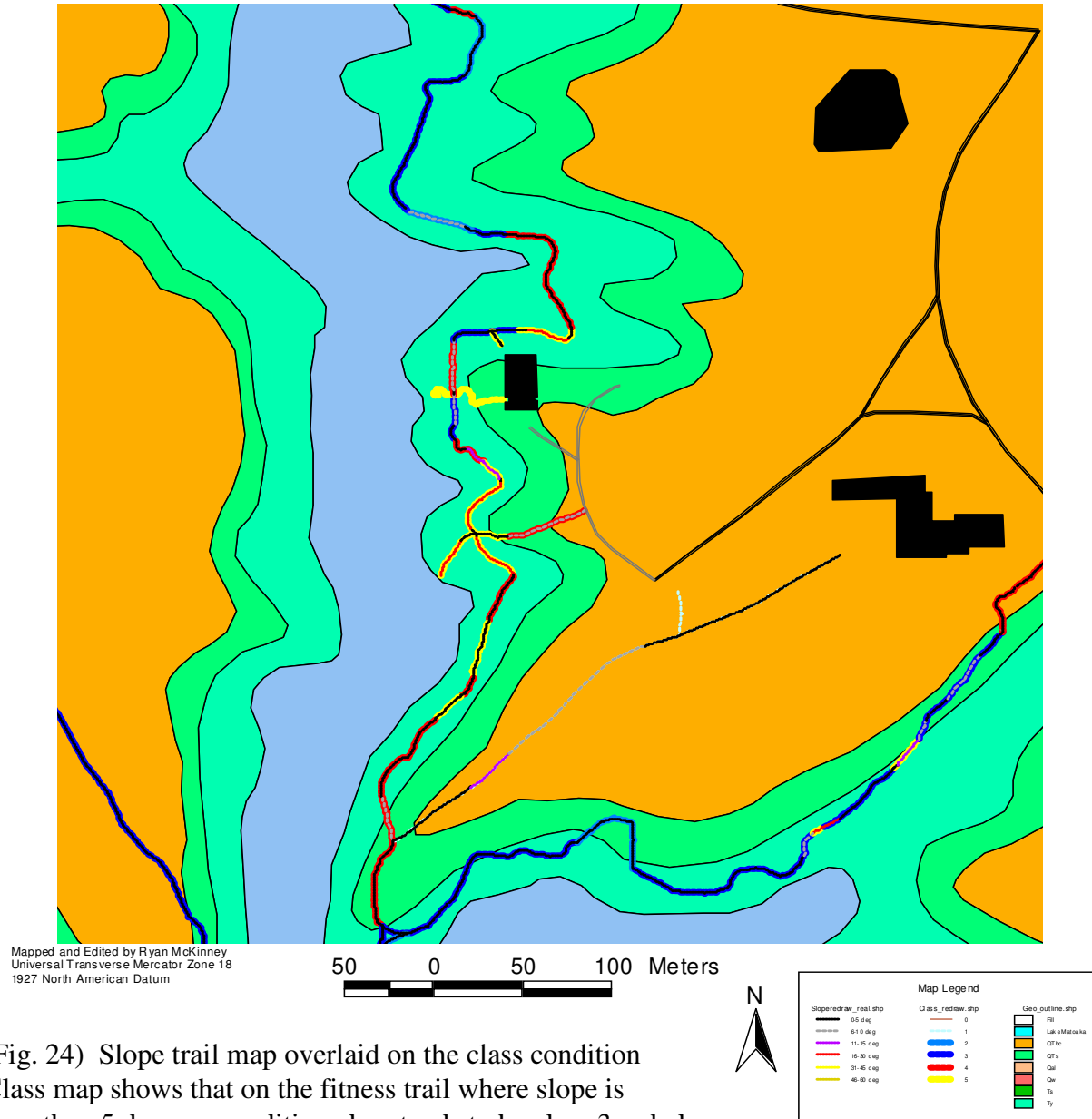
(Fig. 22) Comparison of two sections of trail that both lie in the Yorktown Formation. The section of trail with a slope greater than 10 degrees has formed a gully, while the section of trail that has a slope of less than 5 degrees shows no sign of a gully.

Slope/Class Category



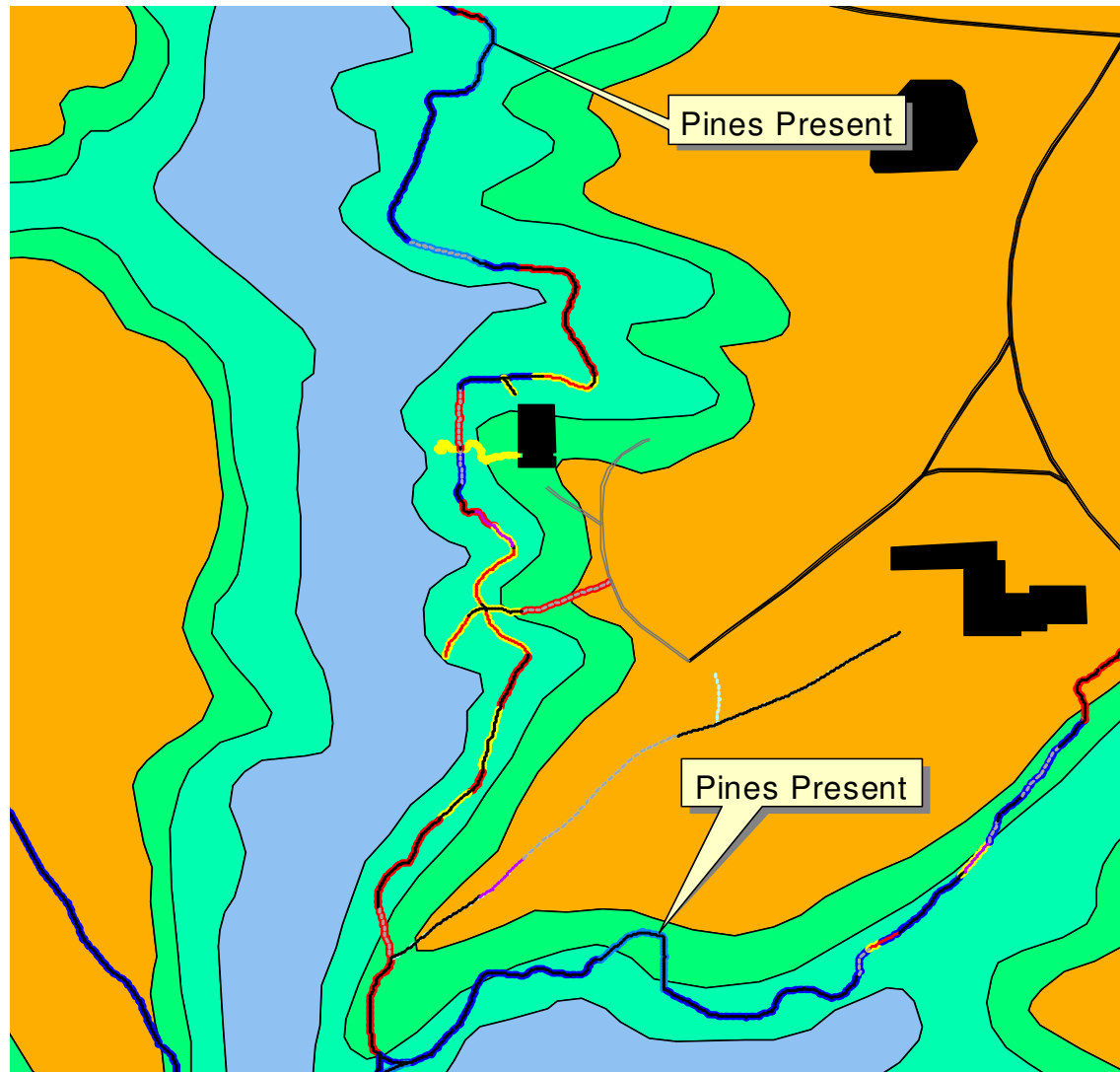
(Fig. 23) The slope trail map overlaid on the condition class map shows the correlation between slope and class condition. As slope increases, class condition gets closer to class 5.

Geolgy and Class Condition



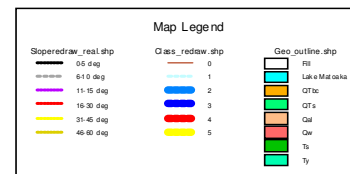
(Fig. 24) Slope trail map overlaid on the class condition
 Class map shows that on the fitness trail where slope is
 Less than 5 degrees condition class tends to be class 3 or below.

Geology and Class Condition



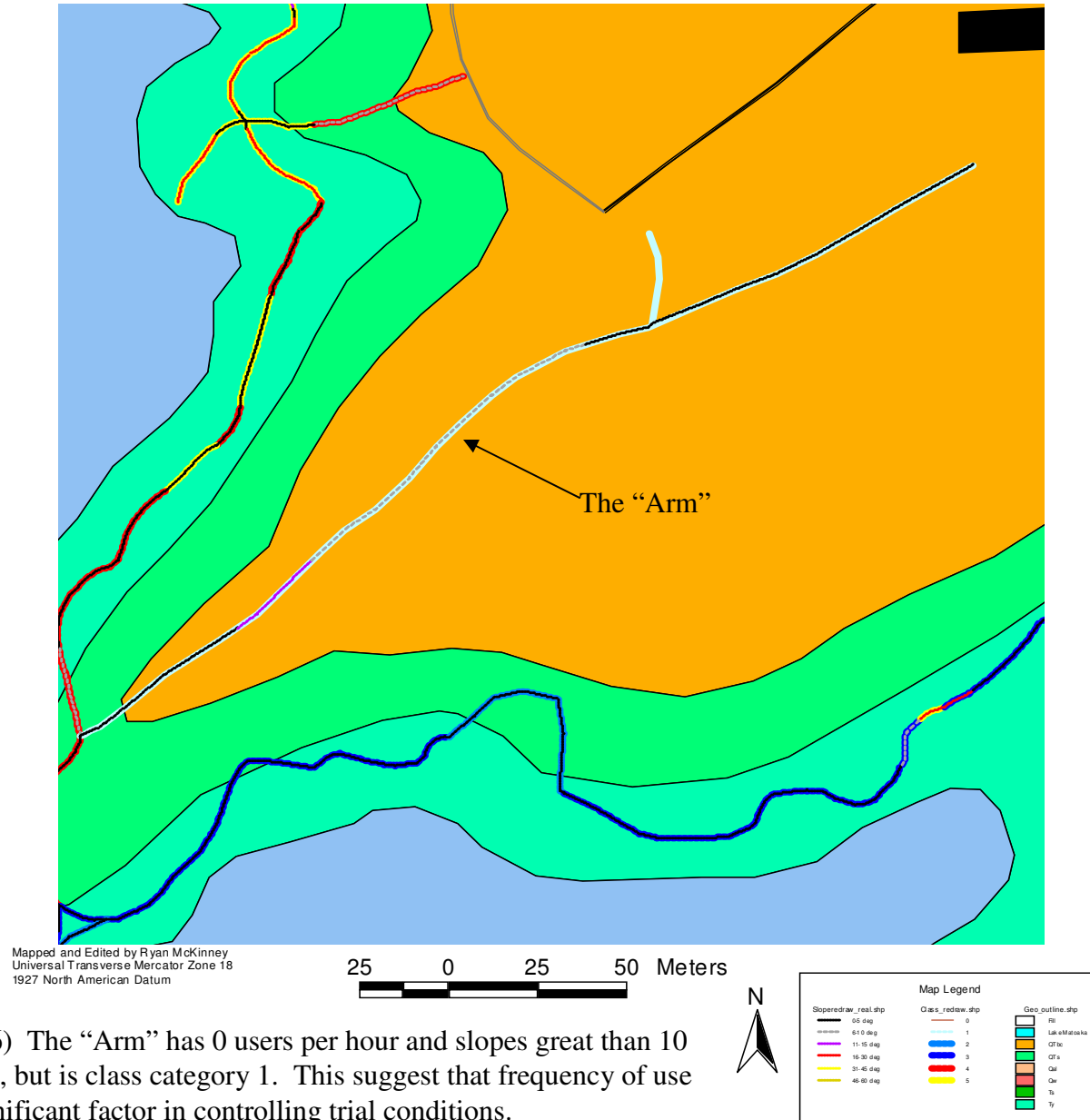
Mapped and Edited by Ryan McKinney
 Universal Transverse Mercator Zone 18
 1927 North American Datum

50 0 50 100 Meters



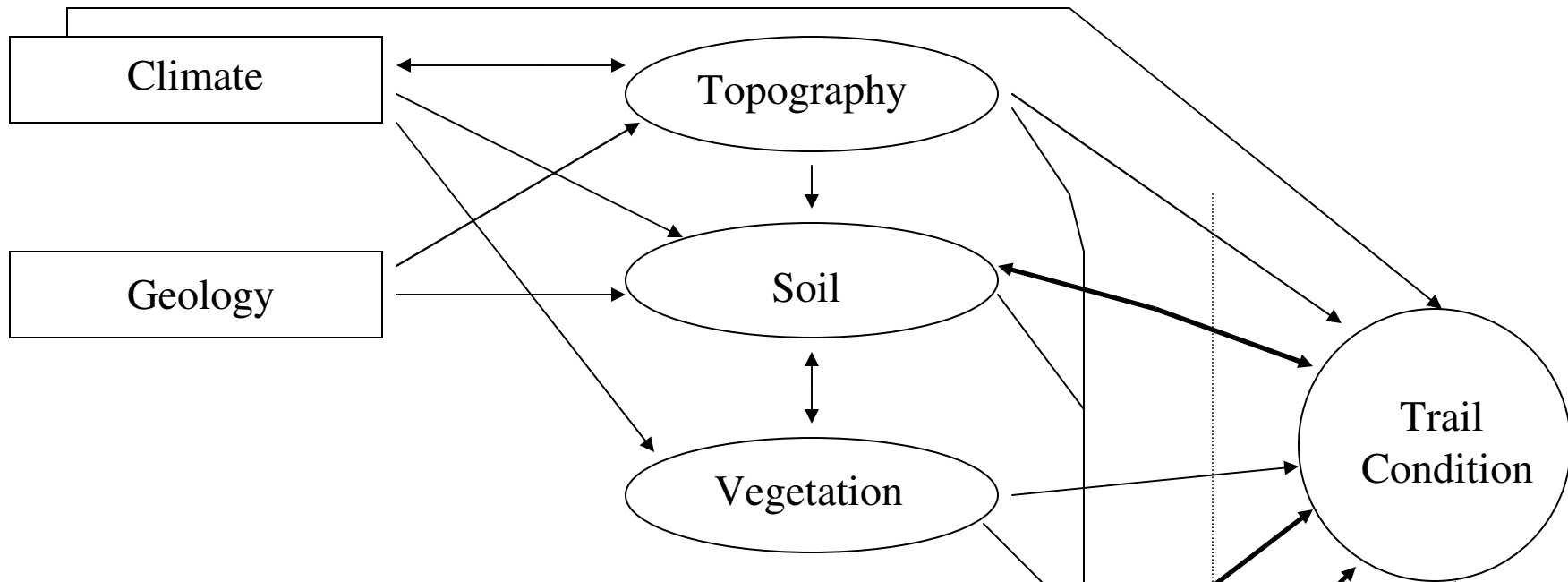
(Fig. 25) Shows the location of where Loblolly Pine trees cover the trail and provide protection from trail users and rainfall.

The "Arm"

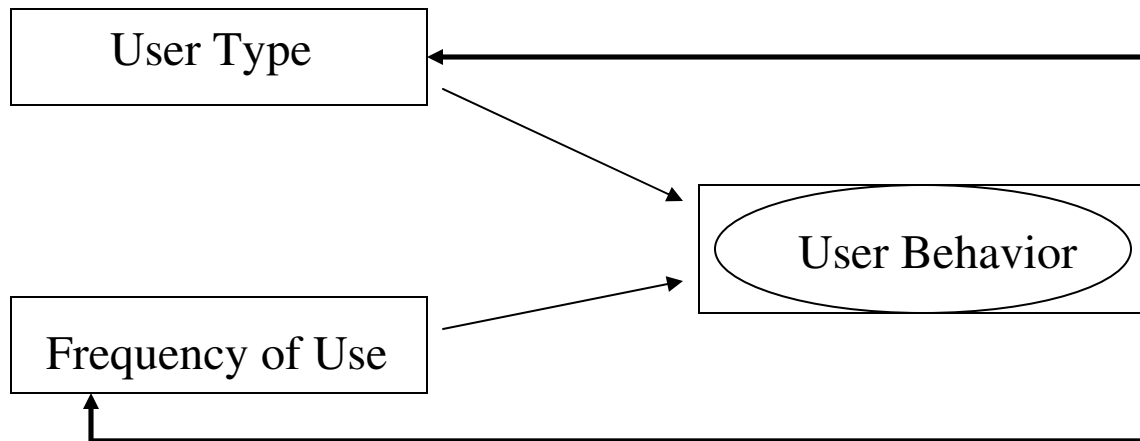


(Fig. 26) The "Arm" has 0 users per hour and slopes great than 10 degrees, but is class category 1. This suggest that frequency of use is a significant factor in controlling trial conditions.

Environmental Factors



Use Related Factors



Managerial
Actions

Key:

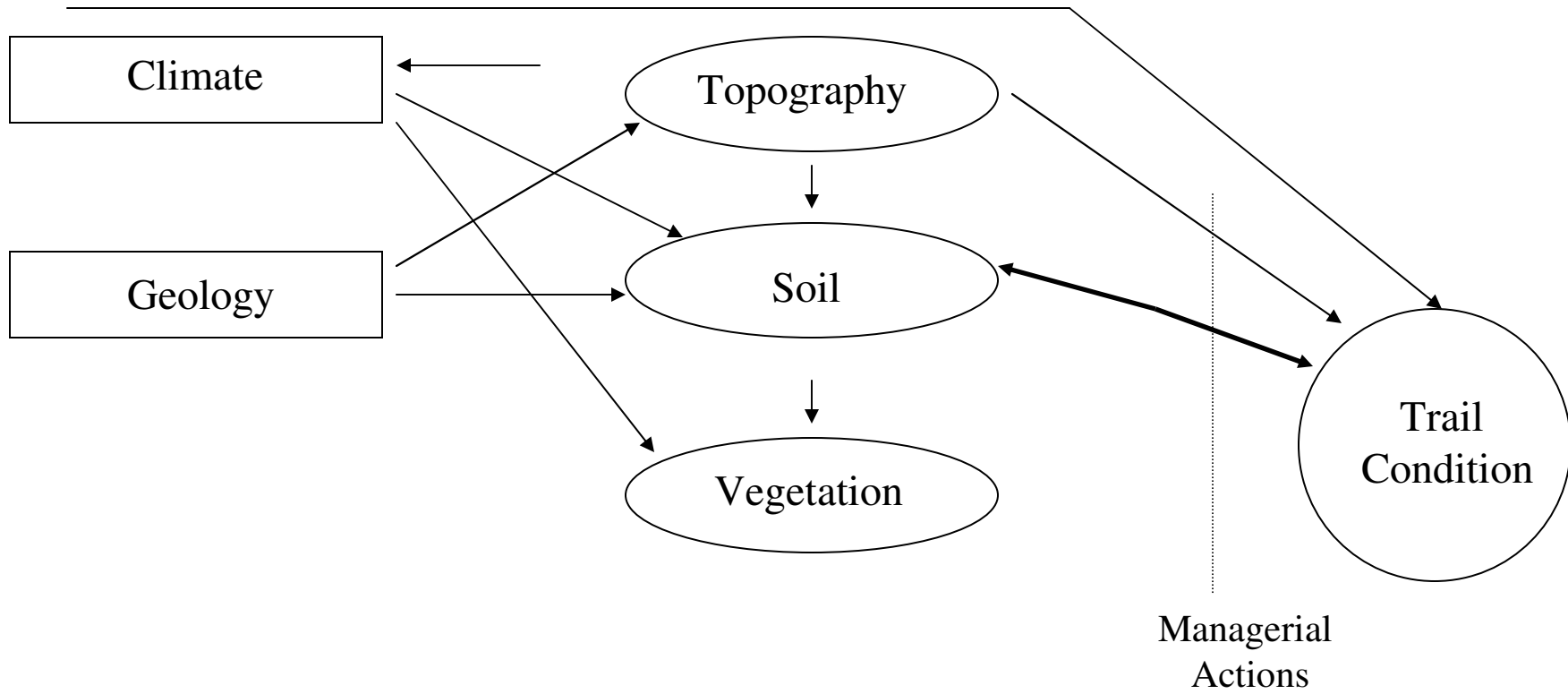
Primary Factor

Intermediate Factor

Effect

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

Environmental Factors



Key:



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.

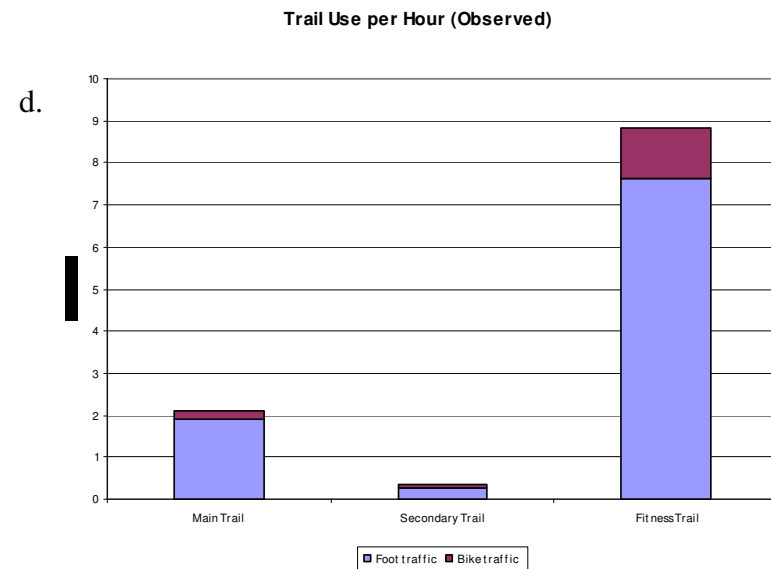
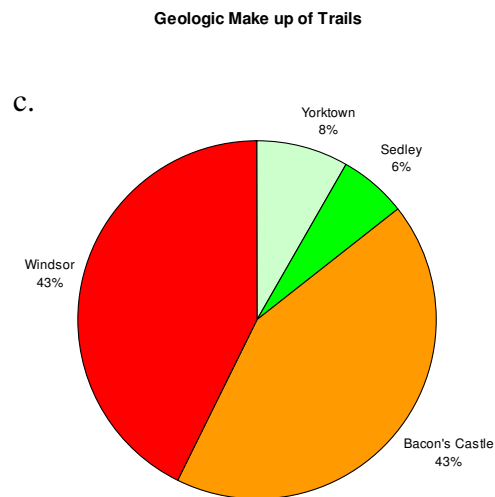
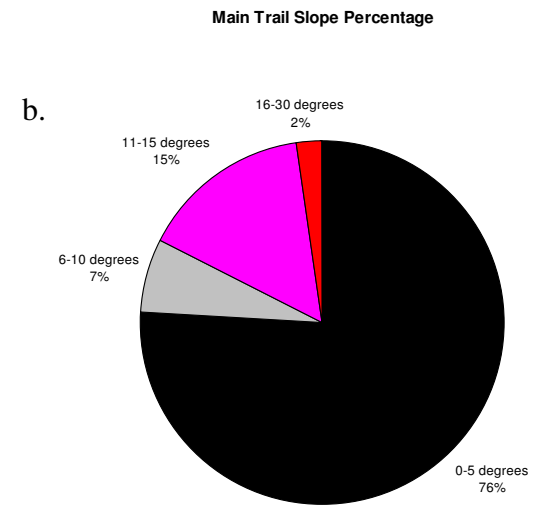
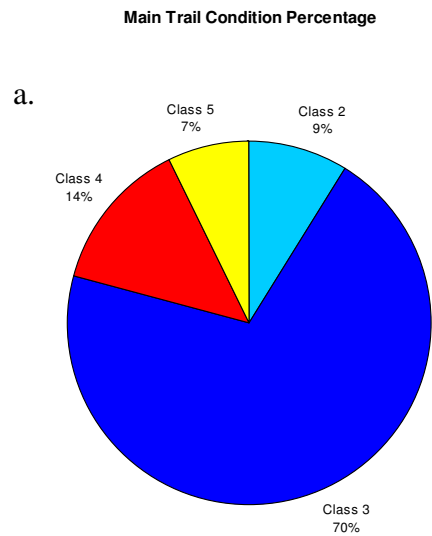
- Trail degradation and vegetative changes are related to frequency of use and trail construction

User Hour

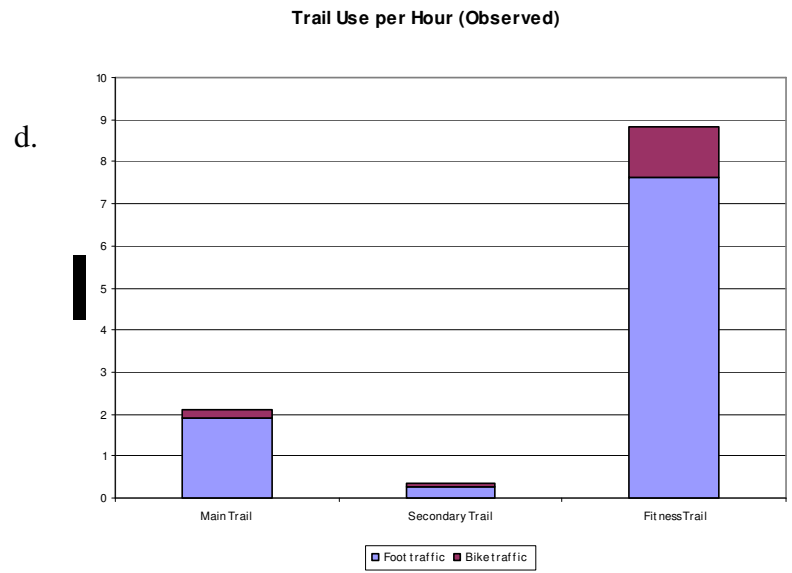
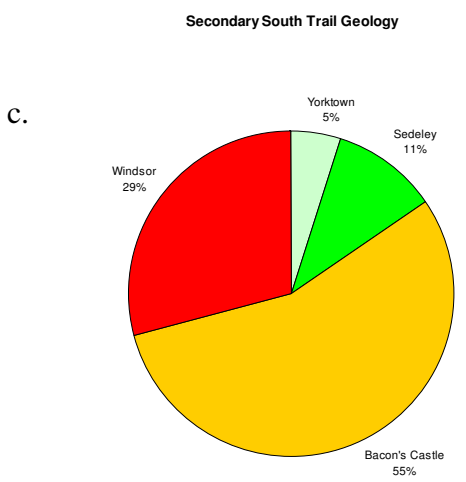
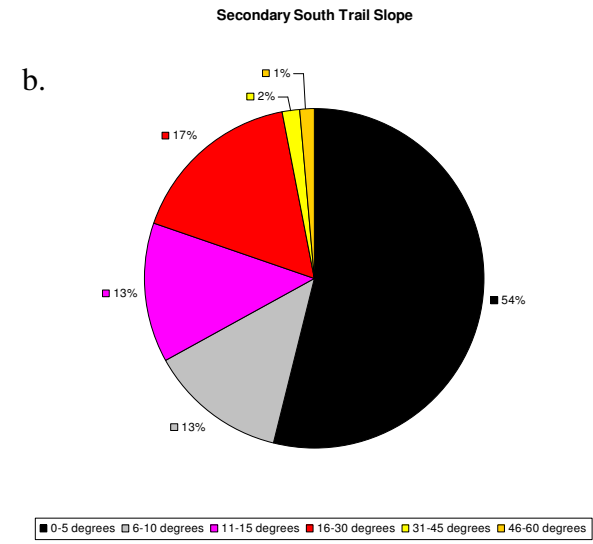
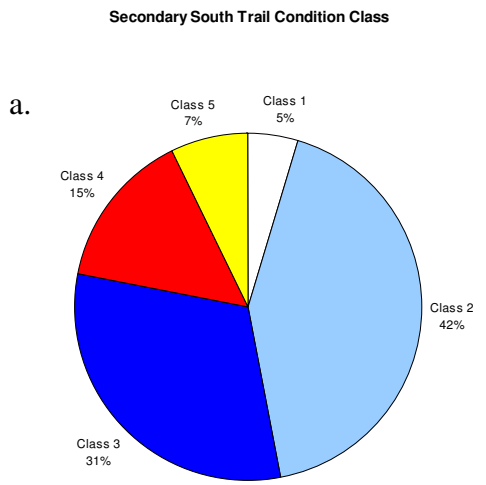
of trail users / # of hours collecting data

Ex.

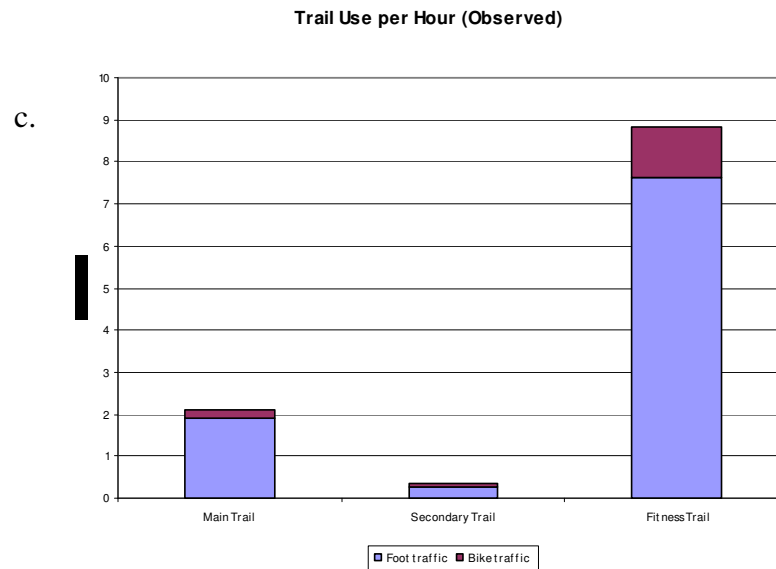
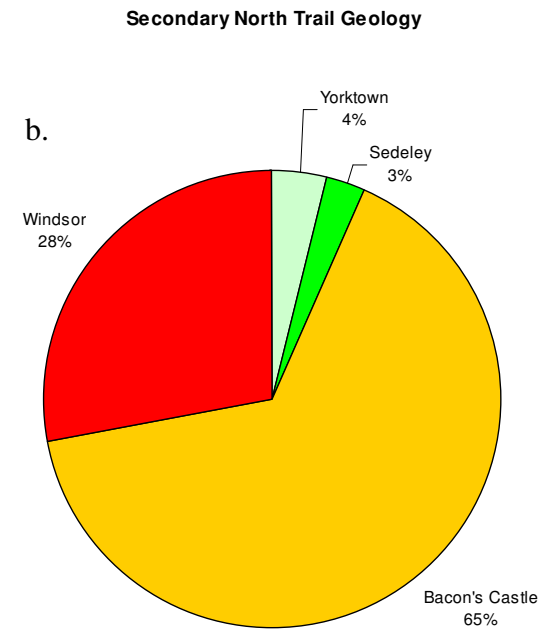
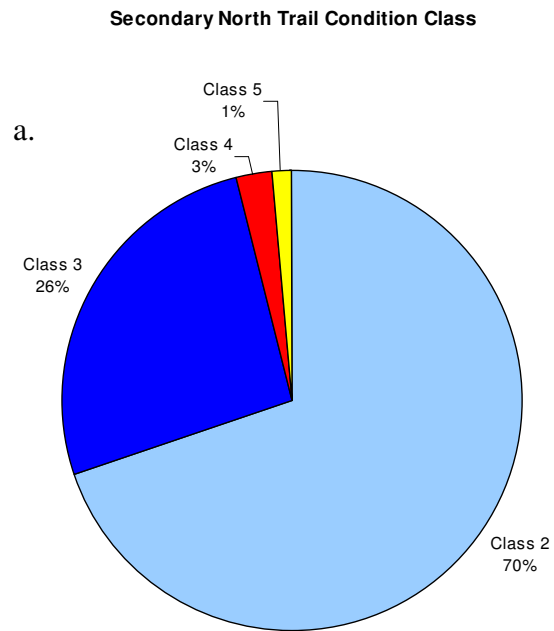
16 trail users / 4 hours in field
= 4 user hours



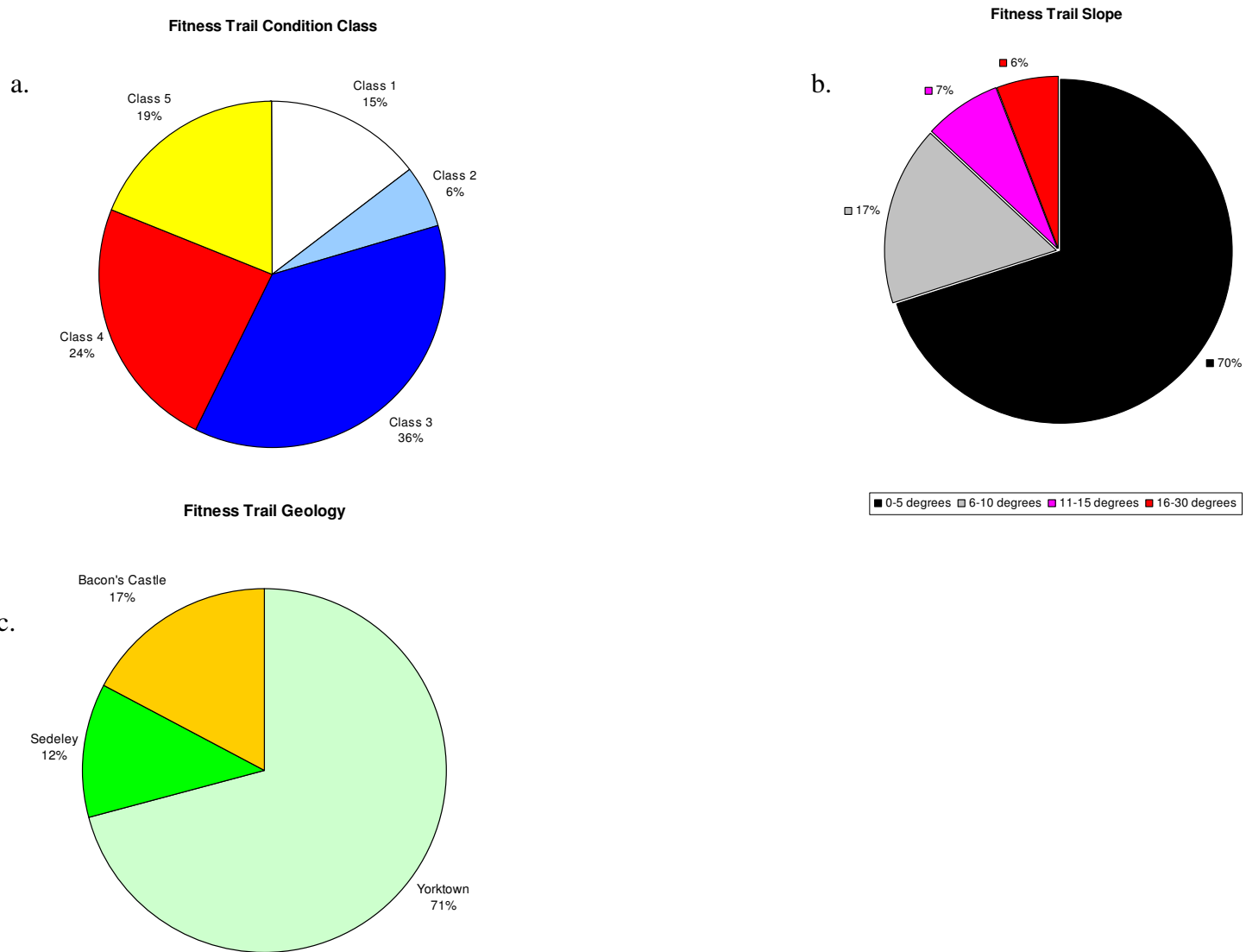
(Fig. 12a) Percentage of main trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the main trail.
 (Fig. 12b) Percentage of main trail has a slope of 0-5, 6-10, 11-15, and 16-30 degrees.
 Fig. 12c) Percentage of main trail that lies in the Yorktown, Sedley, Bacon's Castle or 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.



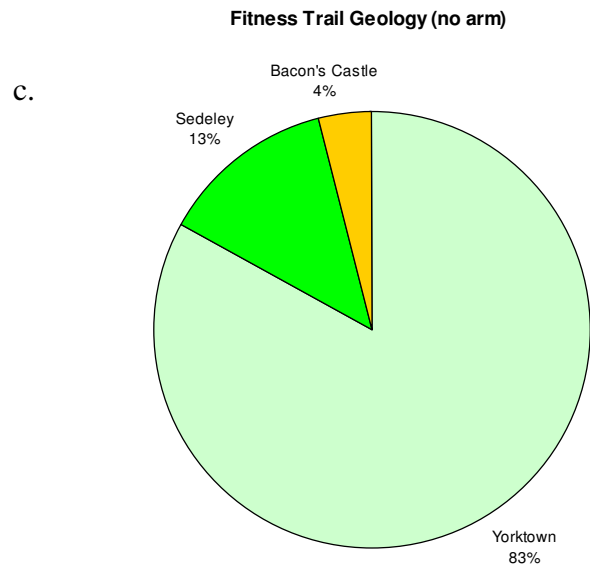
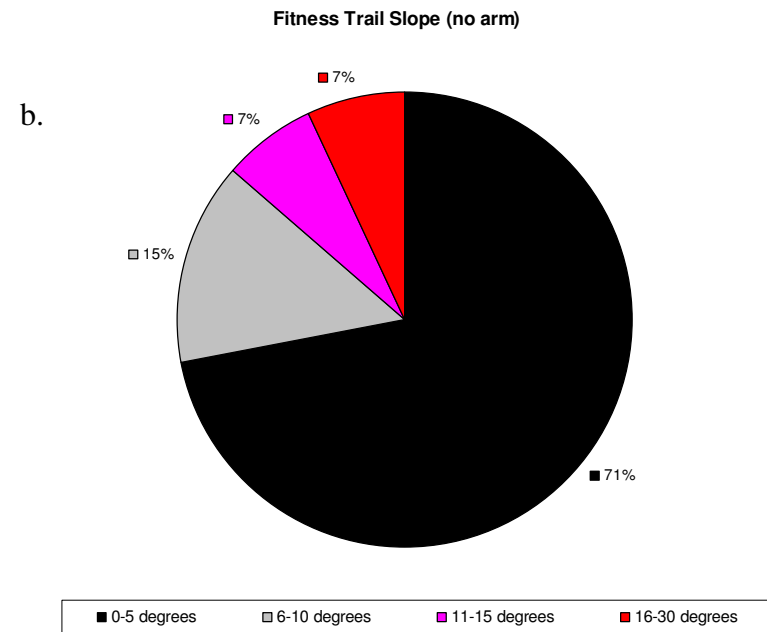
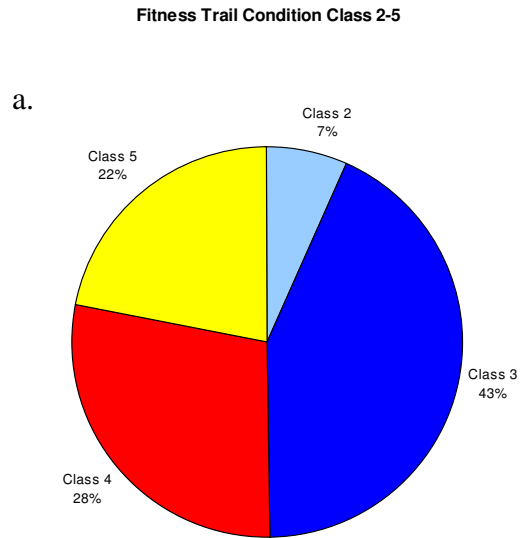
(Fig. 14a) Percentage of secondary north trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the secondary trails.
 (Fig. 14b) Percentage of secondary north trail that lies in the Yorktown, Sedley, Bacon's Castle or Windsor formations.
 (Fig. 14c) Observed trail use per hour 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.

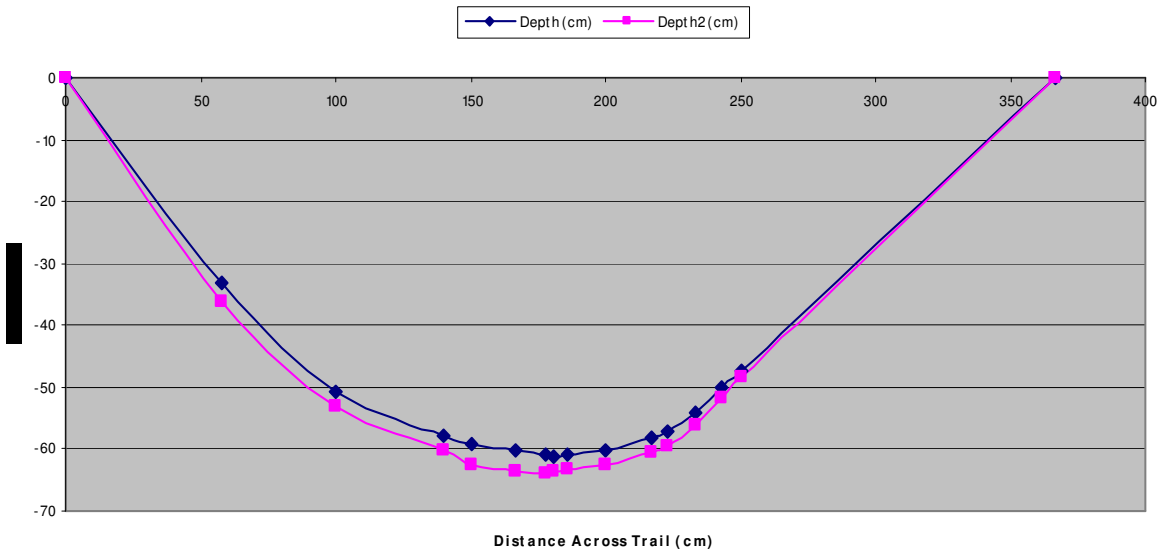


(Fig. 17a) Percentage of fitness trail that is class category 2, 3, 4, or 5. There is no class 0 or 1 trails on the no “arm” fitness trails.

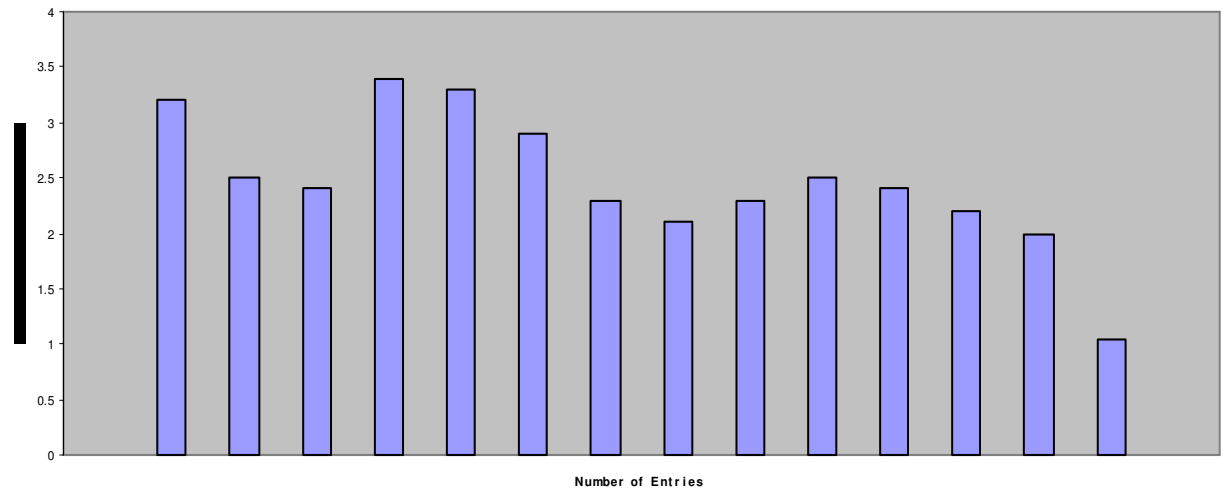
(Fig. 17b) Percentage of no “arm” fitness trail that has a slope of 0-5, 6-10, 11-15, and 16-30 degrees.

(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)



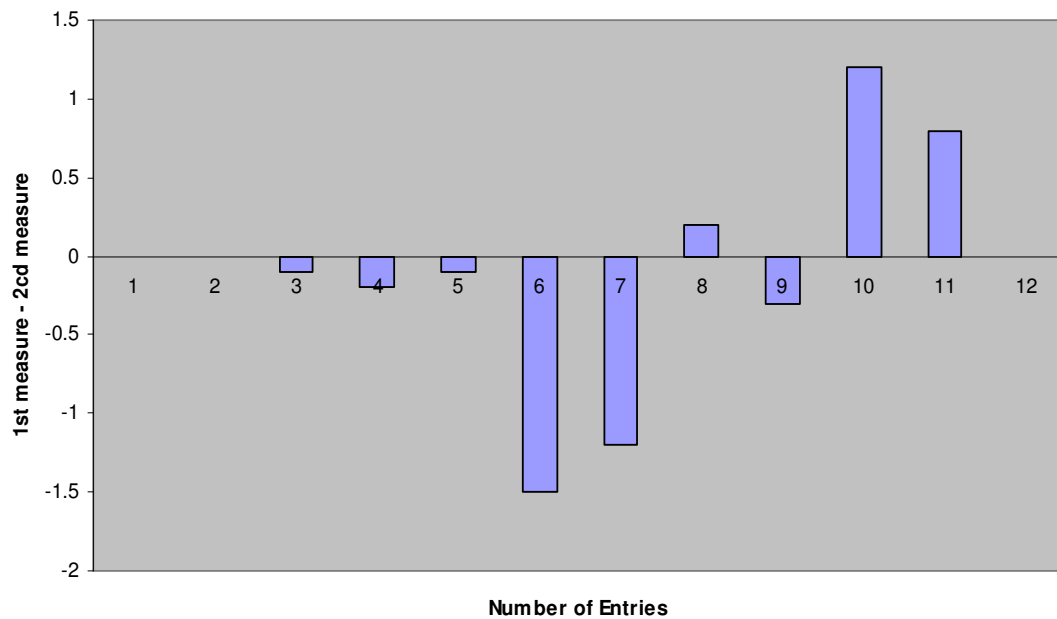
Difference Graph ST-1



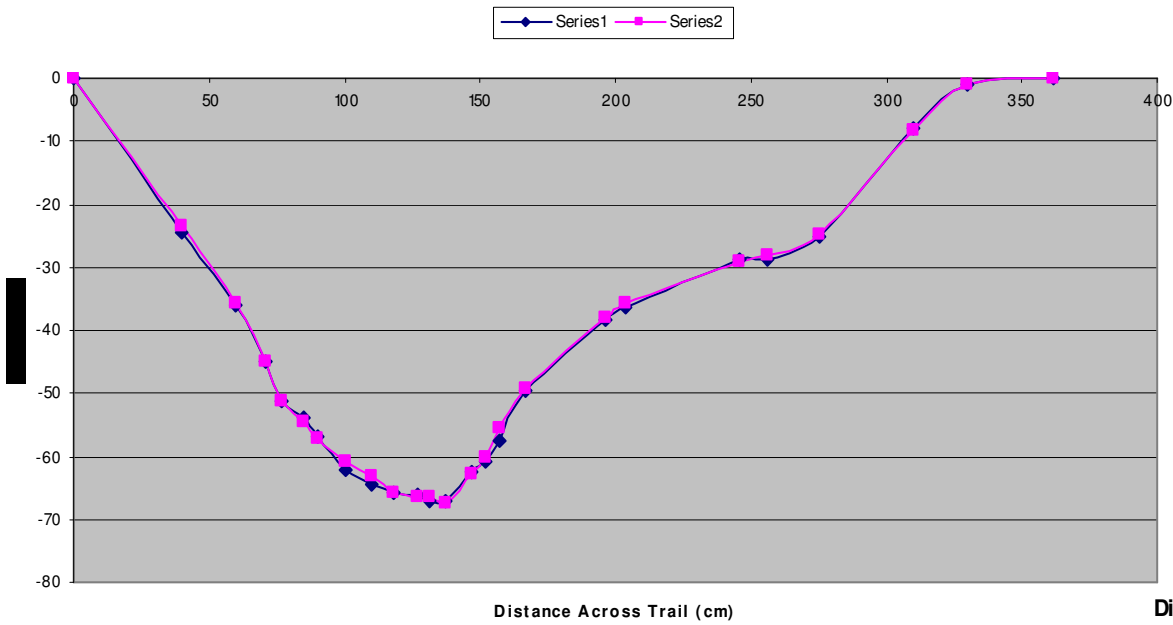
Compare Trail Cross Section (ST-3)



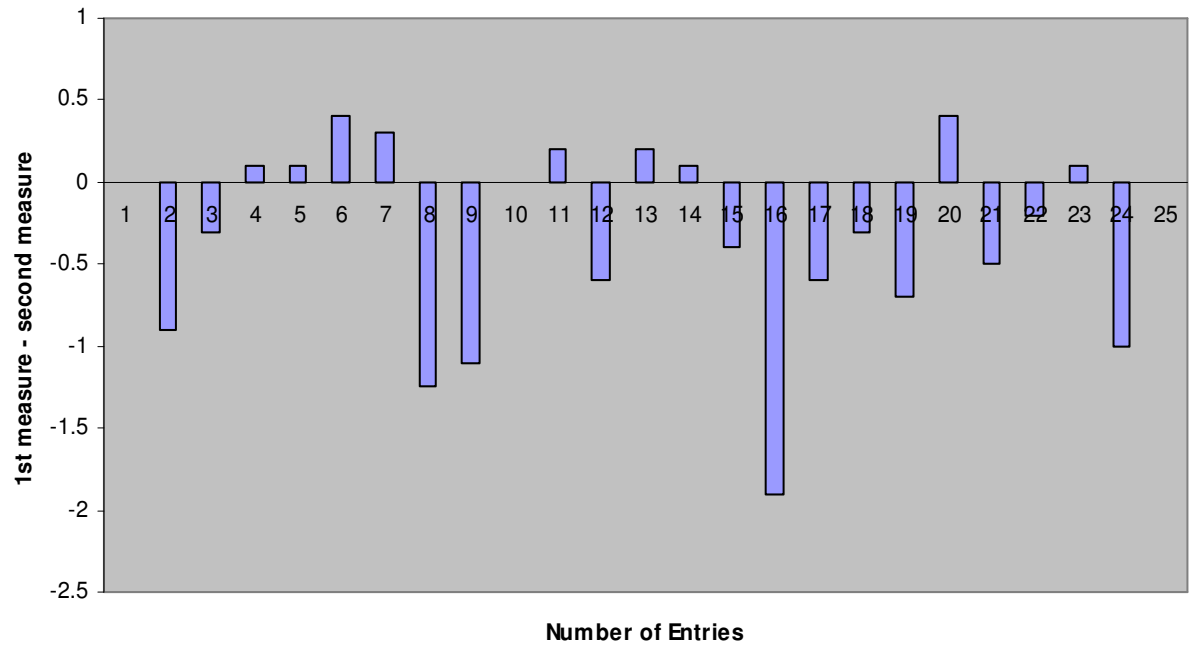
Difference Graph (ST-3)



Compare Trail Cross Section (ST-2)

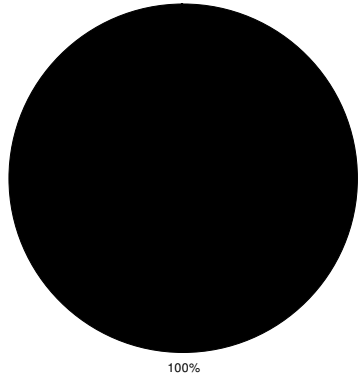


Difference Graph ST-2



e.

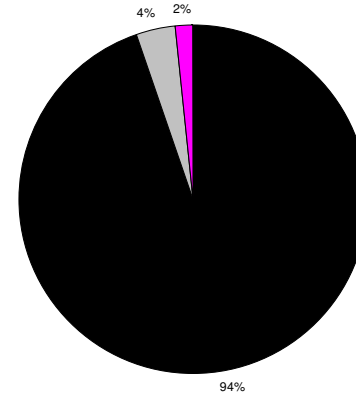
Main Trail Class 2 Slope Percentage



■ Class 2 w/slope 0-5 deg

f.

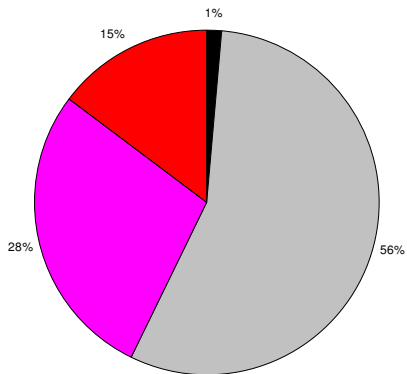
Main Trail Class 3 Slope Percentage



■ Class 3 w/slope 0-5 deg □ Class 3 w/slope 6-10 deg ■ Class 3 w/slope 11-15deg

g.

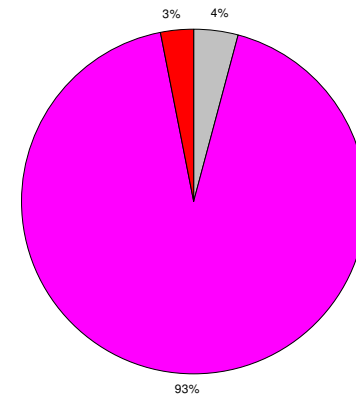
Main Trail Class 4 Slope Percentage



■ Class 4 w/slope 0-5 deg □ Class 4 w/slope 6-10 deg
 ■ Class 4 w/slope 11-15deg ■ Class 4 w/slope 16-30deg

h.

Main Trail Class 5 Slope Percentage



□ Class 5 w/slope 6-10 deg ■ Class 5 w/slope 11-15deg
 ■ Class 5 w/slope 16-30deg

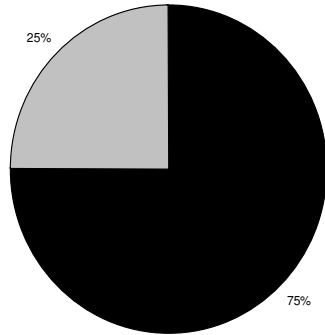
(Fig. 12e) Slope percentage of Main Trail Class Category 2.

(Fig. 12f) Slope percentage of Main Trail Class Category 3.

(Fig. 12g) Slope percentage of Main Trail Class Category 4.

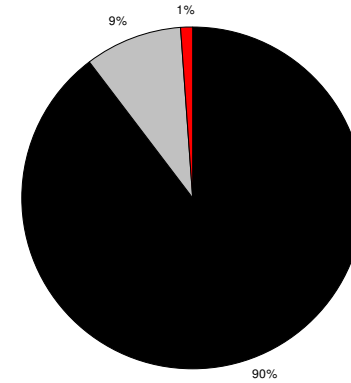
(Fig. 12h) Slope percentage of Main Trail Class Category 5.

Fitness Trail Class 2 Slope Percentage



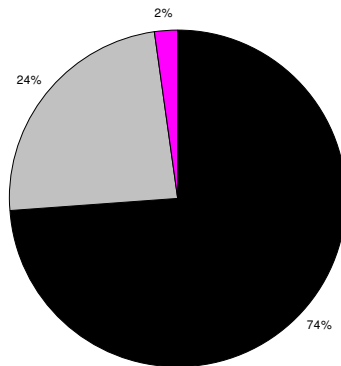
■ Class 2 w/slope 0-5 deg □ Class 2 w/slope 6-10 deg

Fitness Trail Class 3 Slope Percentage



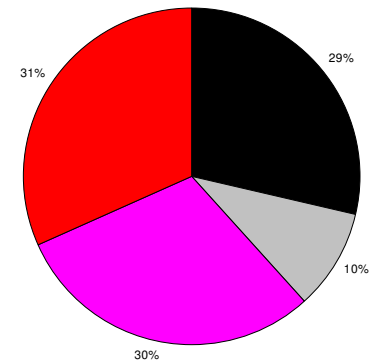
■ Class 3 w/slope 0-5 deg □ Class 3 w/slope 6-10 deg ■ Class 3 w/slope 16-30deg

Fitness Trail Class 4 Slope Percentage



■ Class 4 w/slope 0-5 deg □ Class 4 w/slope 6-10 deg ■ Class 4 w/slope 11-15deg

Fitness Trail Class 5 Slope Percentage



■ Class 5 w/slope 0-5 deg □ Class 5 w/slope 6-10 deg ■ Class 5 w/slope 11-15deg ■ Class 5 w/slope 16-30deg

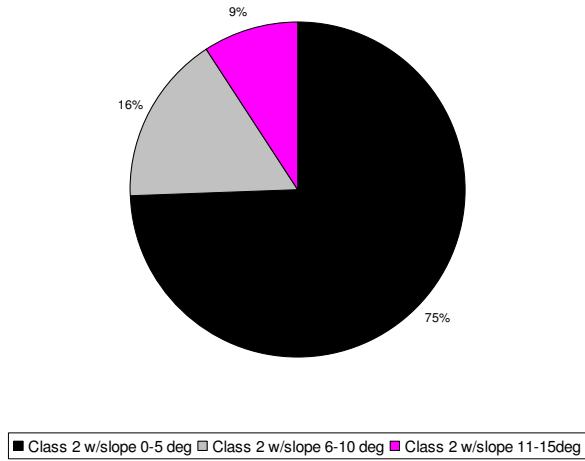
(Fig. 14e) Slope percentage of the Fitness Trail Class Category 2.

(Fig. 14f) Slope percentage of the Fitness Trail Class Category 3.

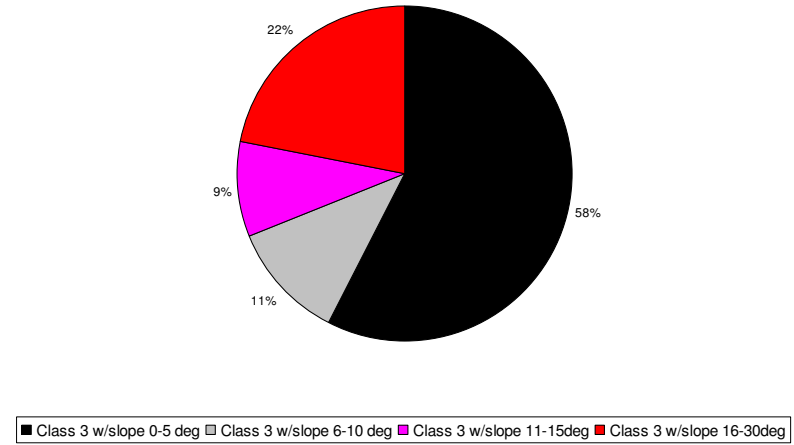
(Fig. 14g) Slope percentage of the Fitness Trail Class Category 4.

(Fig. 14h) Slope percentage of the Fitness Trail Class Category 5.

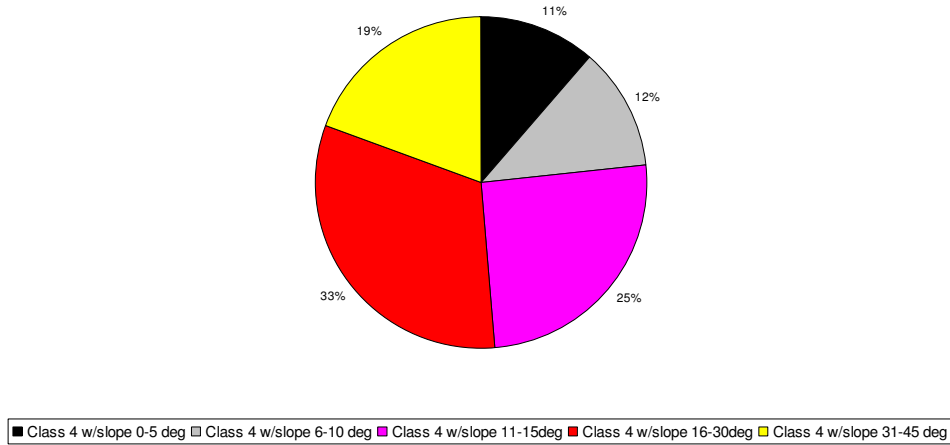
Secondary South Trail Class 2 Slope Percentage



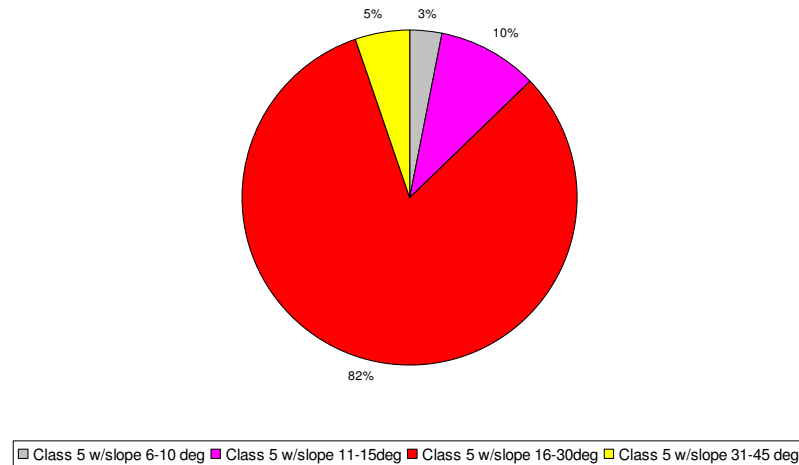
Secondary South Trail Class 3 Slope Percentage



Secondary South Trail Class 4 Slope Percentage



Secondary South Trail Class 5 Slope Percentage



- (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.