

Guide to Sustainable Mountain Trails

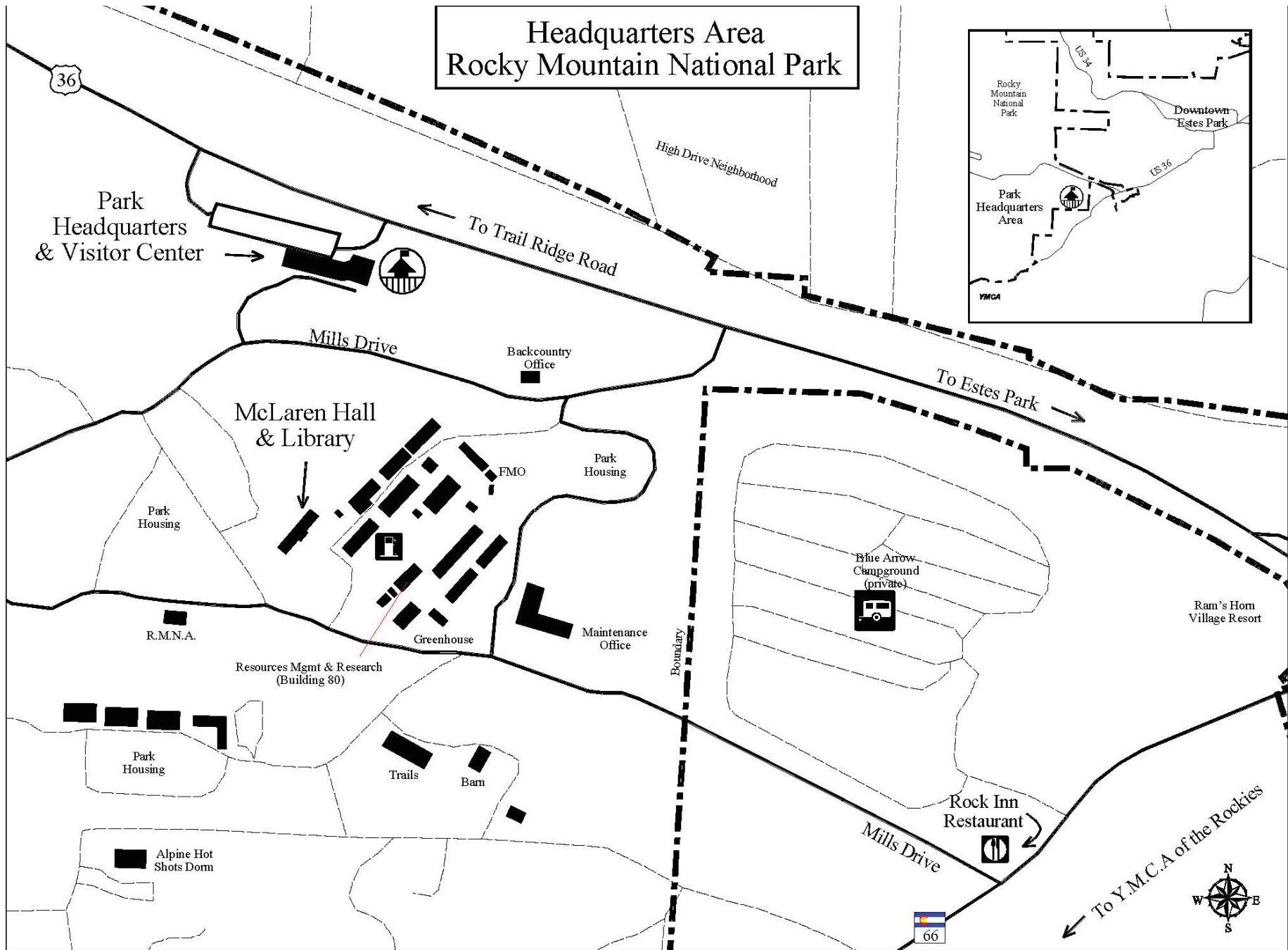


MacGregor Falls Trail
Rocky Mountain National Park
June 16-17, 2012

McGregor Mountain Lodge

Advanced
Trail Assessment, Planning &
Design Sketchbook
Training Workbook

Rocky Mountain National Park - Headquarters Area



National Park Service Foundations

Organic Act _____

National Park Service Management Policies _____

Natural Resources Management Guidelines _____

National Park Service Green Parks Plan _____

Wilderness _____

CCC - Era _____

Recreation Accessibility _____

Sustainability _____

Value Analysis / Choosing by Advantages _____

Robin Winks Article _____

Preservation / Conservation Literature _____

Other _____

Rocky Mountain National Park Foundations

Foundation Documents / Significance / Purpose _____

Trail Plan _____

Wilderness Management Plan _____

Backcountry Management Plan _____

Project Clearance Form _____

Sign Plan _____

Opportunities for Recreation Accessibiliy _____

Appropriateness _____

Other _____

Interdisciplinary Team / Roles & Responsibilities

Natural Resouce Specialist

Cultural Resource Specialist

Maintenance Foreman

Maintenance Worker

Trail Specialist

Landscape Architect

Park Engineer

Interpretation/Education

Ranger Division

Park Planner

Administration/Budget

Other 1. 2. 3. 4.

MacGregor Falls Trail Project - Stakeholder Analysis

	Stakeholder	Interest	Influence	Information
I				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes

[illegible]

Background

2. _____

3. _____

4. _____

5. _____

I. _____

2. _____

3. _____

4. _____

5. _____

I. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

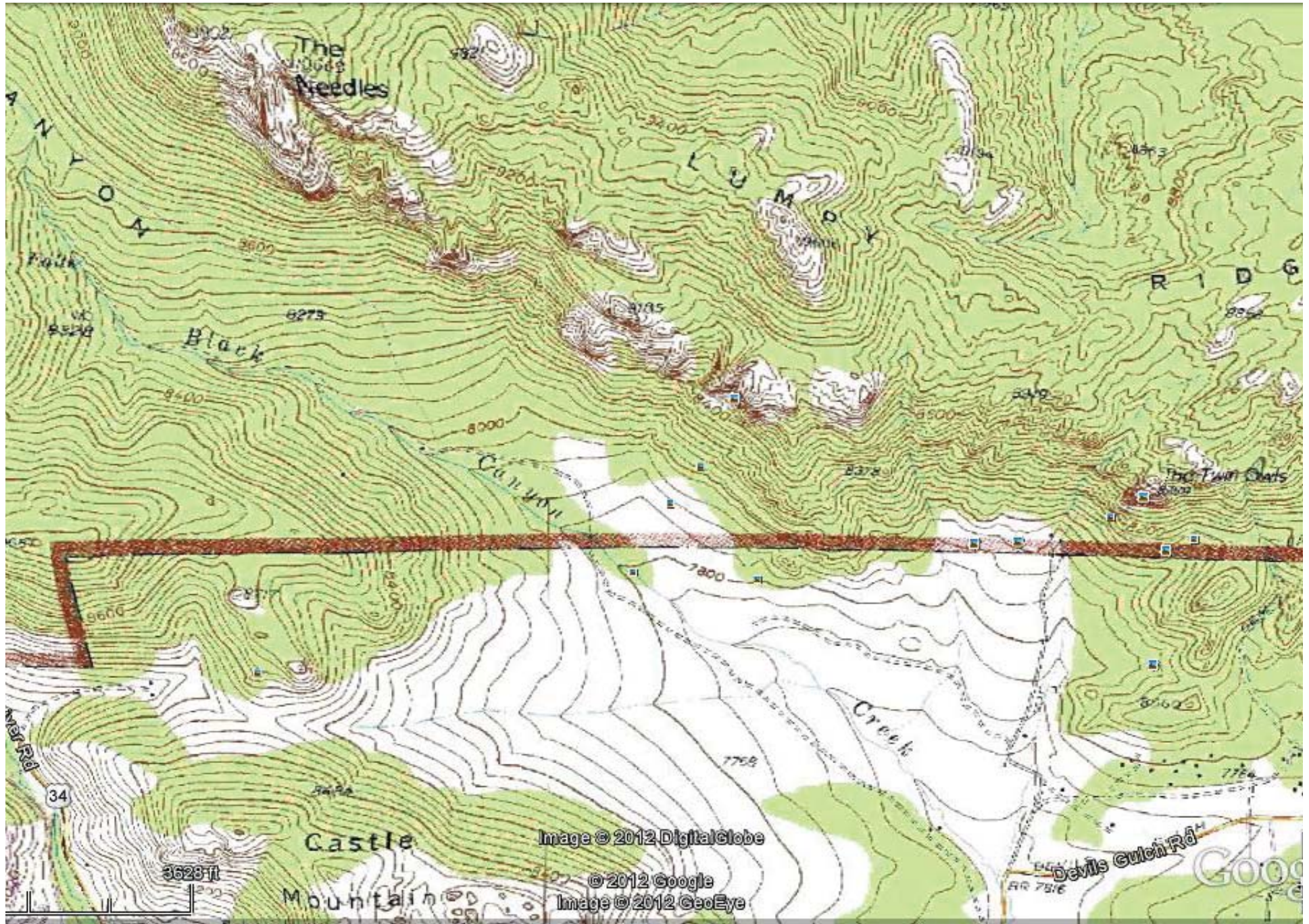
8. Establish public / private partnership_____

9. Prepare Grant Application & Attachments_____

10. Implement Sustainable Corridor _____

Other _____

USGS Topographic Base Map - MacGregor Falls Trail Vicinity



Pitfalls to Avoid / Lessons Learned

Pitfalls to Avoid

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Other

This image shows a blank sheet of white paper with horizontal blue or grey ruling lines, typical of notebook paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Lessons Learned

- I. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
- IO. _____

Other

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.

Aerial View - MacGregor Falls Trail

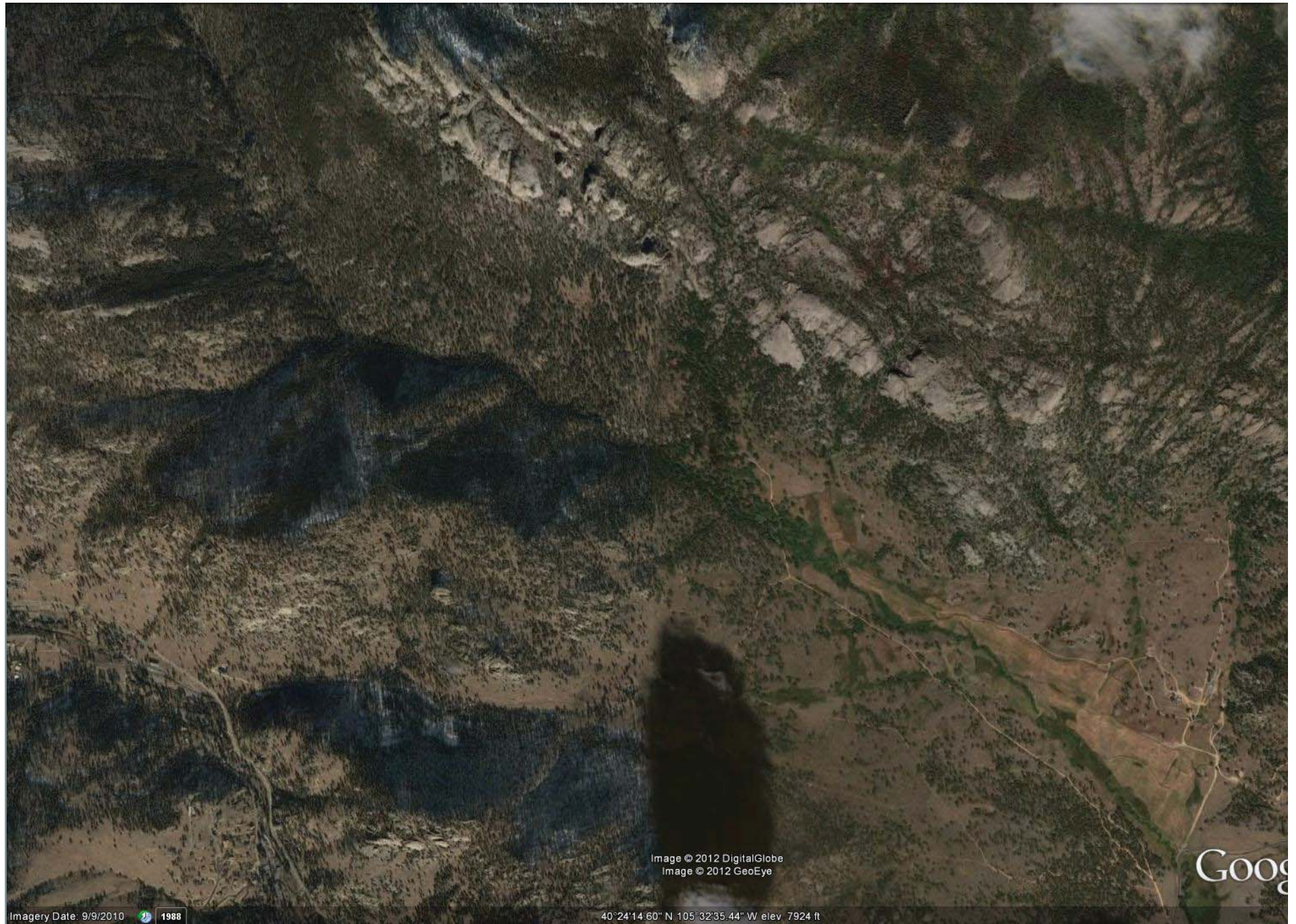


Image © 2012 DigitalGlobe
Image © 2012 GeoEye

Google

Imagery Date: 9/9/2010 1988

40°24'14.60" N 105°32'35.44" W elev. 7924 ft

Geographic Context / Ecosystems & Climate / Users Characteristics

Geographic Context _____

Ecosystems

Climate

User Characteristics

Primary Access Points _____

[illegible]

Project Scope



ASLA Policies / Choosing by Advantages

ASLA Policies

1 Environmental Ethics _____

2 Research _____

3 Environmental Sustainability _____

4 Open Space _____

5 Wildlife Habitat _____

6 Wetlands _____

7 National Parks _____

8 Public Lands & Forests _____

9 Visual Resources _____

10 Water Quality & Conservation _____

11 Invasive Species _____

Choosing by Advantages

1 Protect Park Resources _____

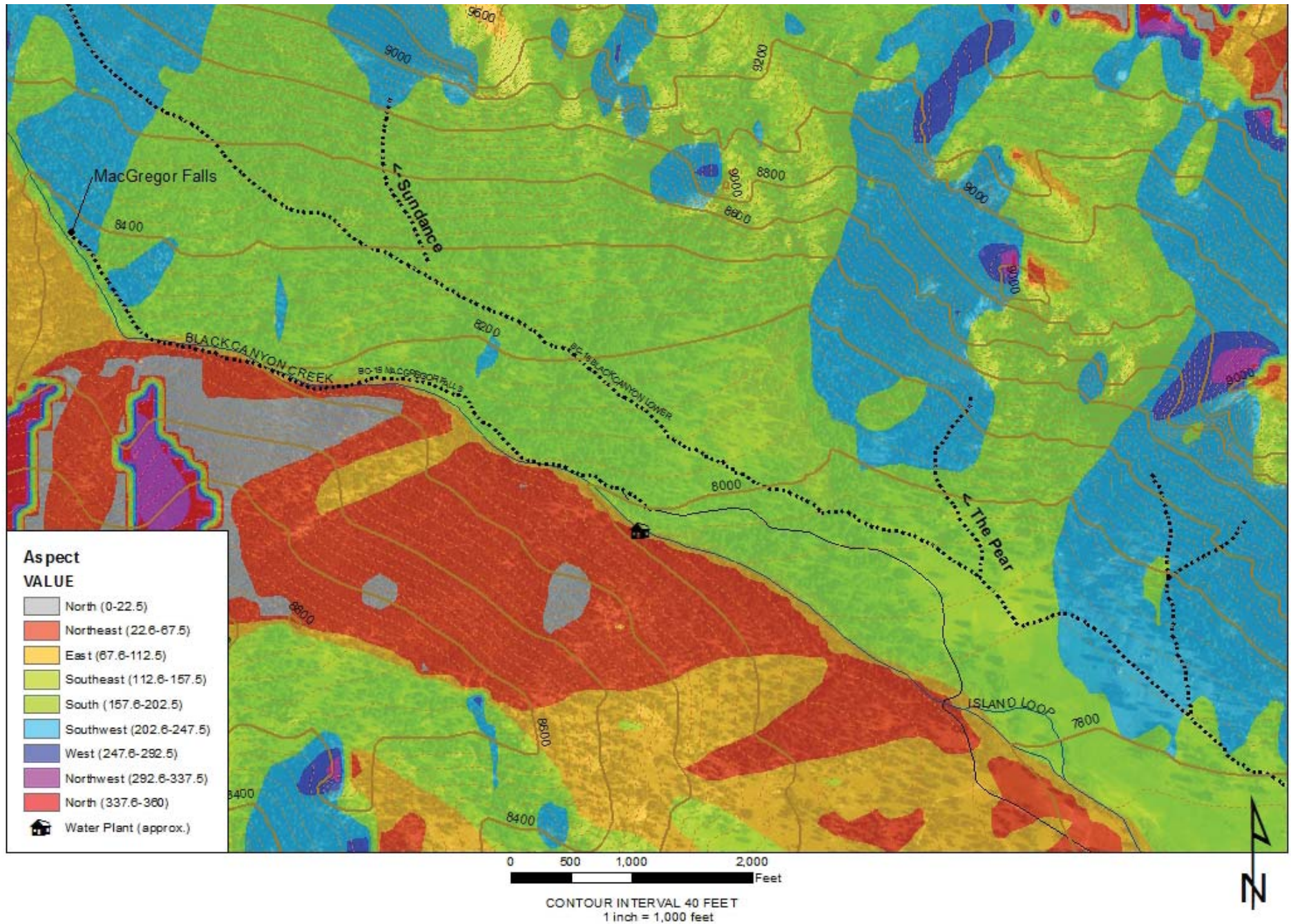
2 Provide Educational & Interpretive Opportunities _____

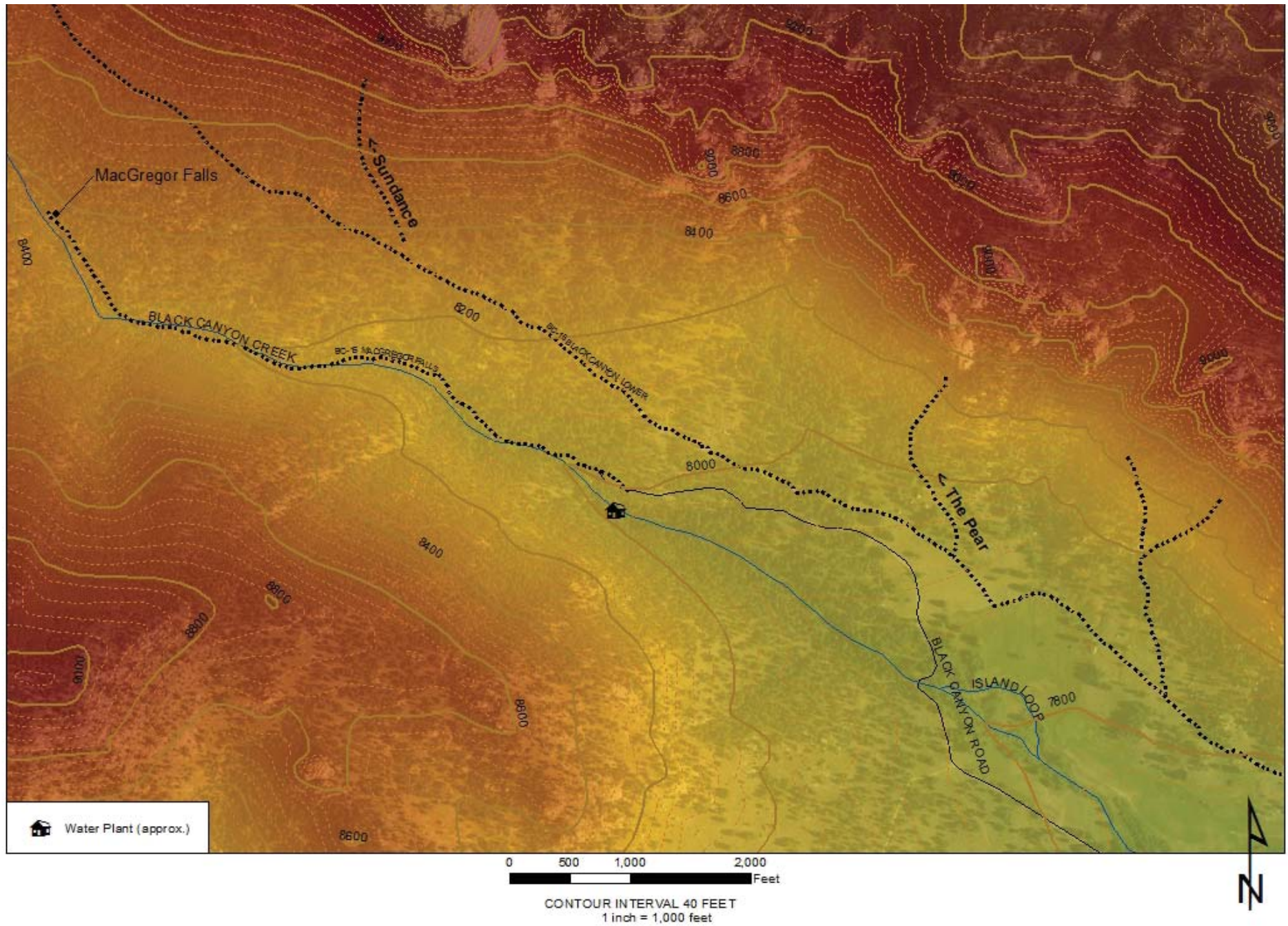
3 Improve Management Efficiency & Sustainability _____

4 Protect Employee & Public Health, Safety & Welfare _____

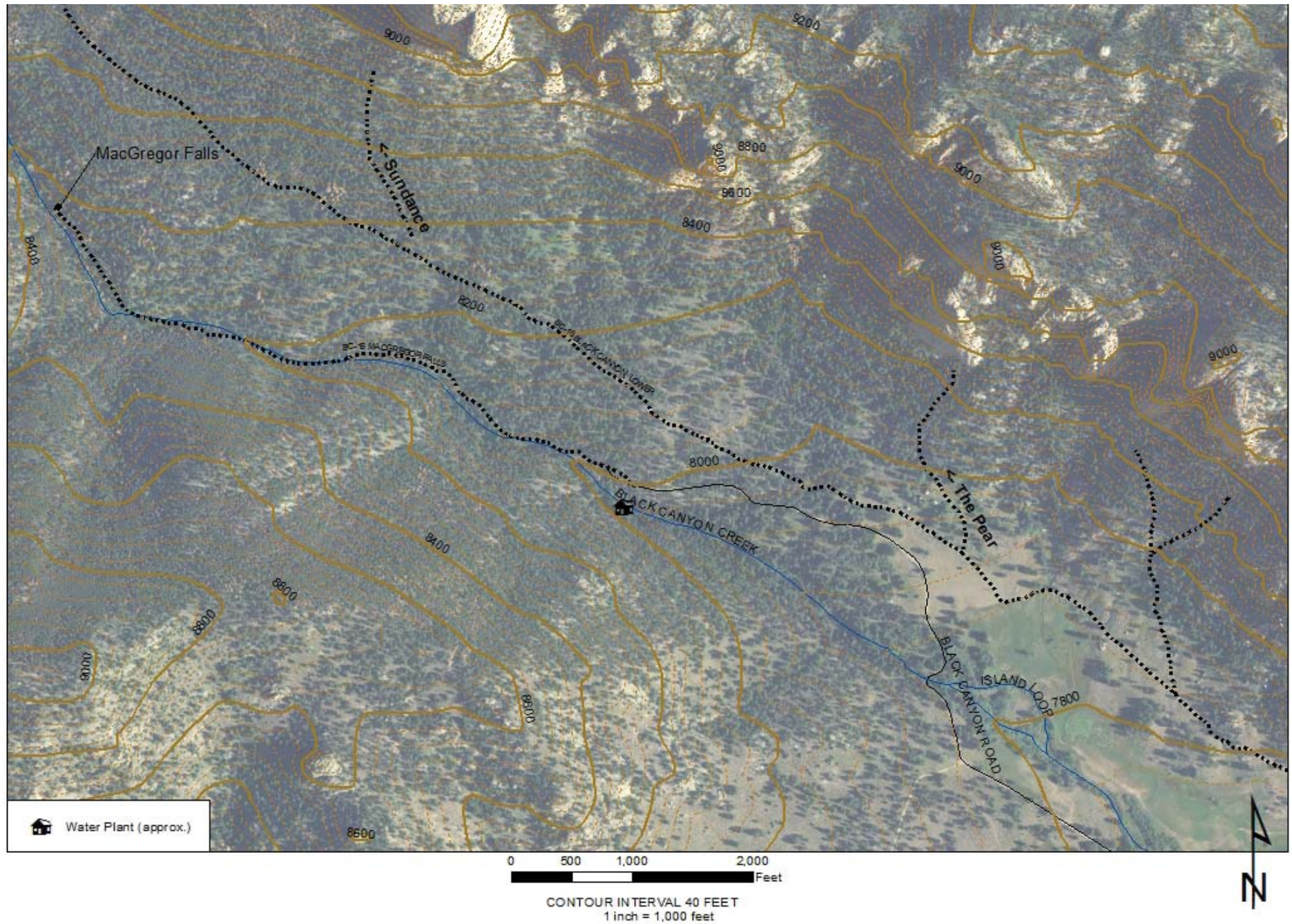
5 Provide Other Advantages to the National Park System _____

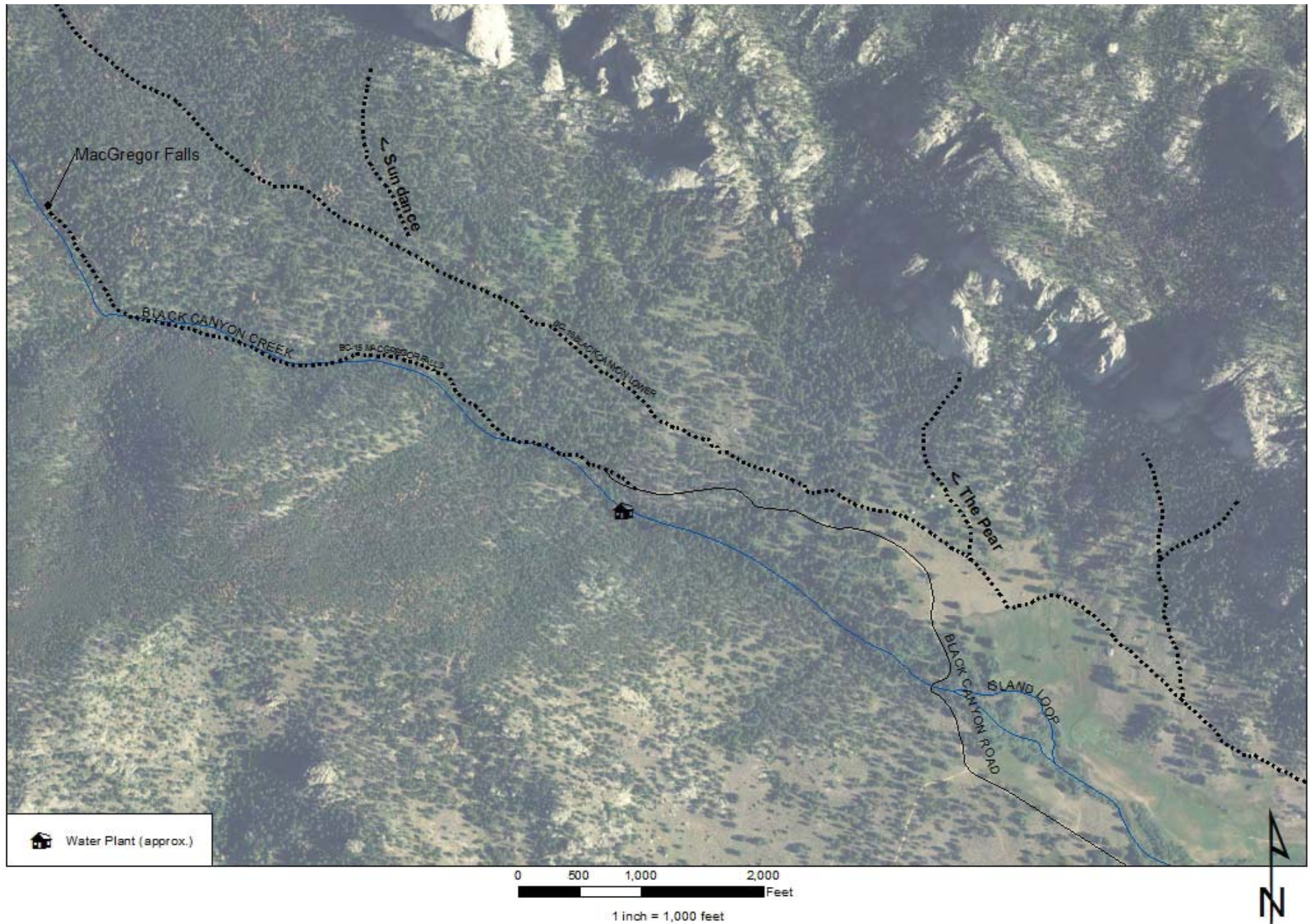
GIS Export - Aspect Map



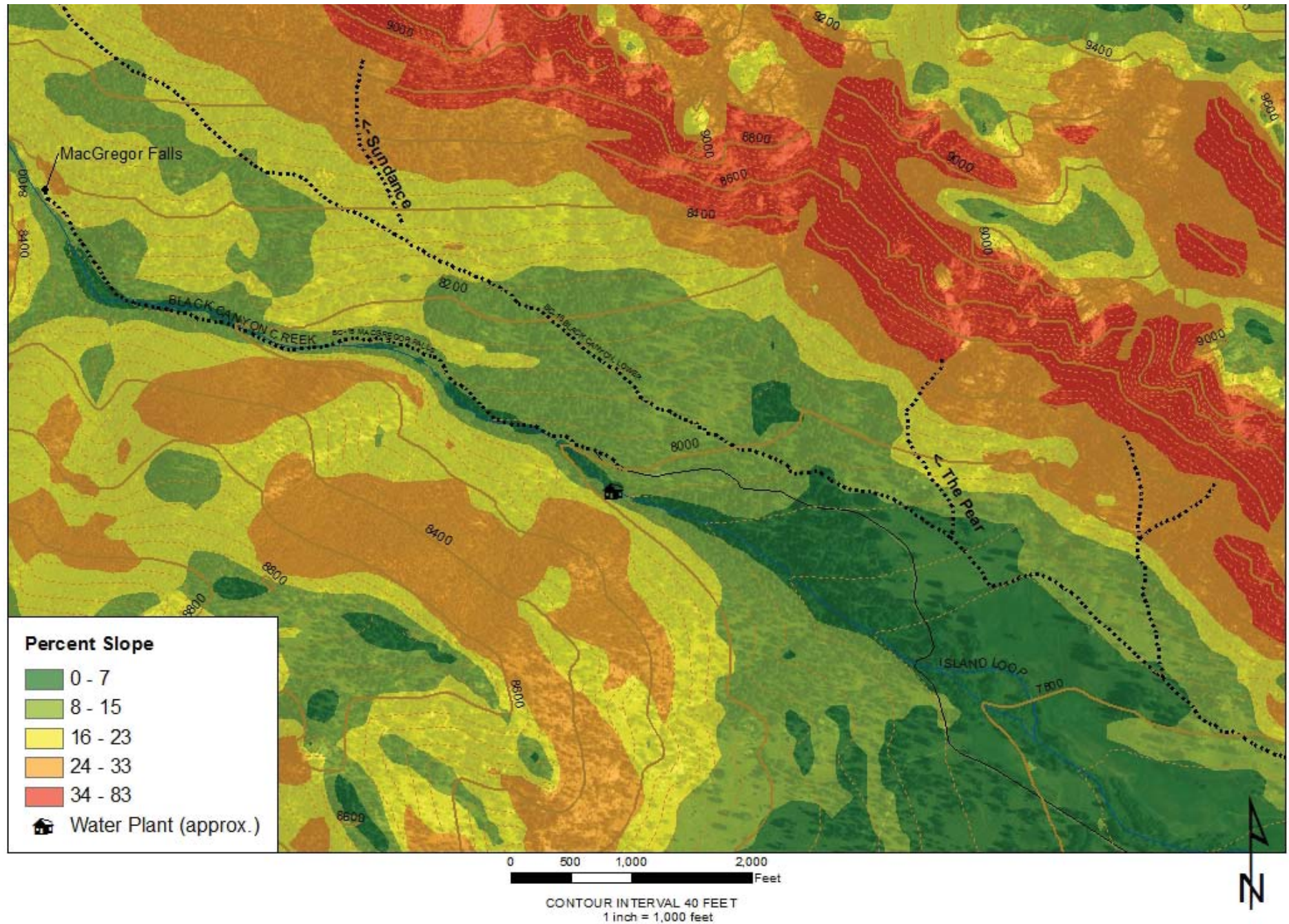


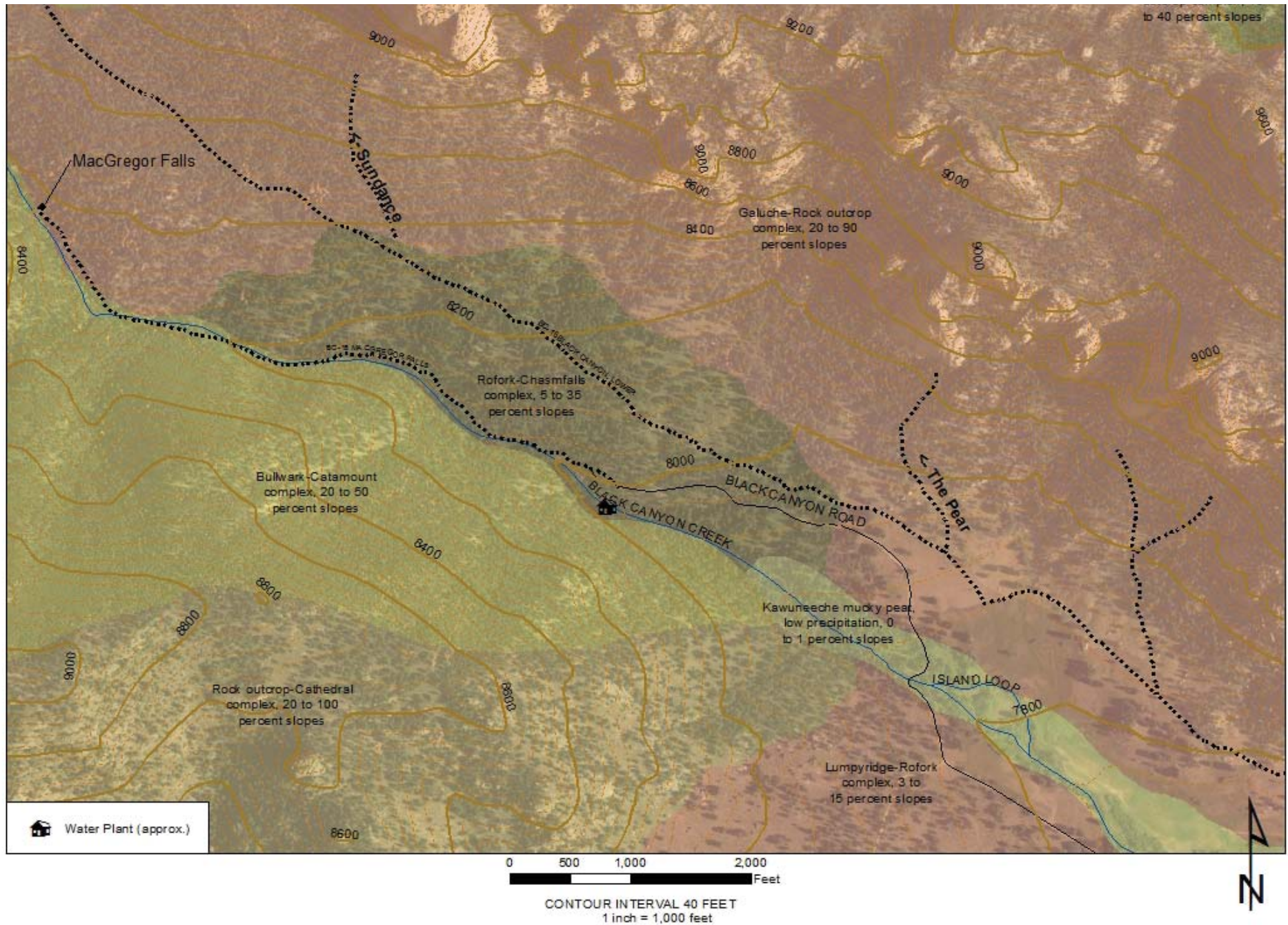
GIS Export - 40 Foot Contours Map



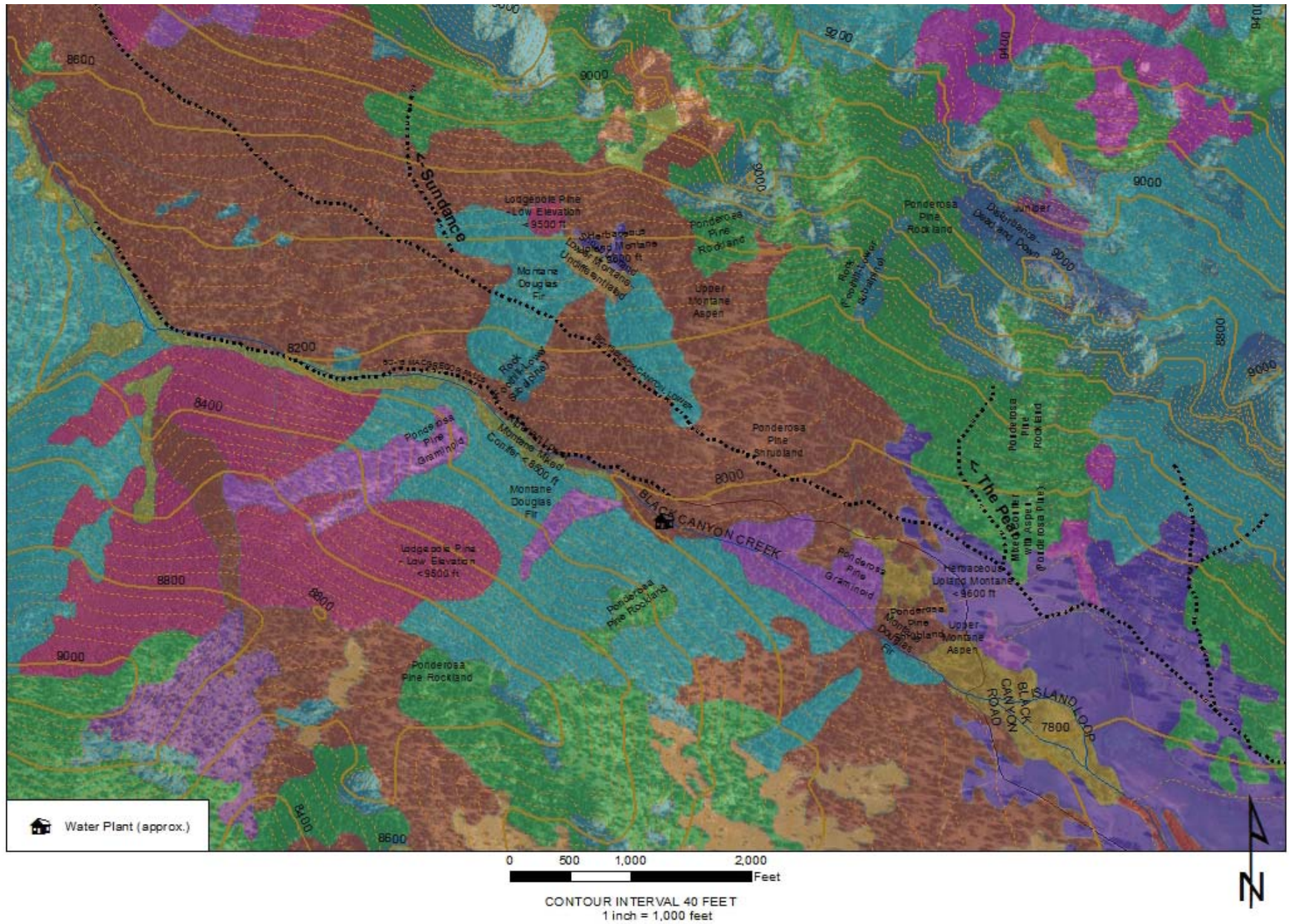


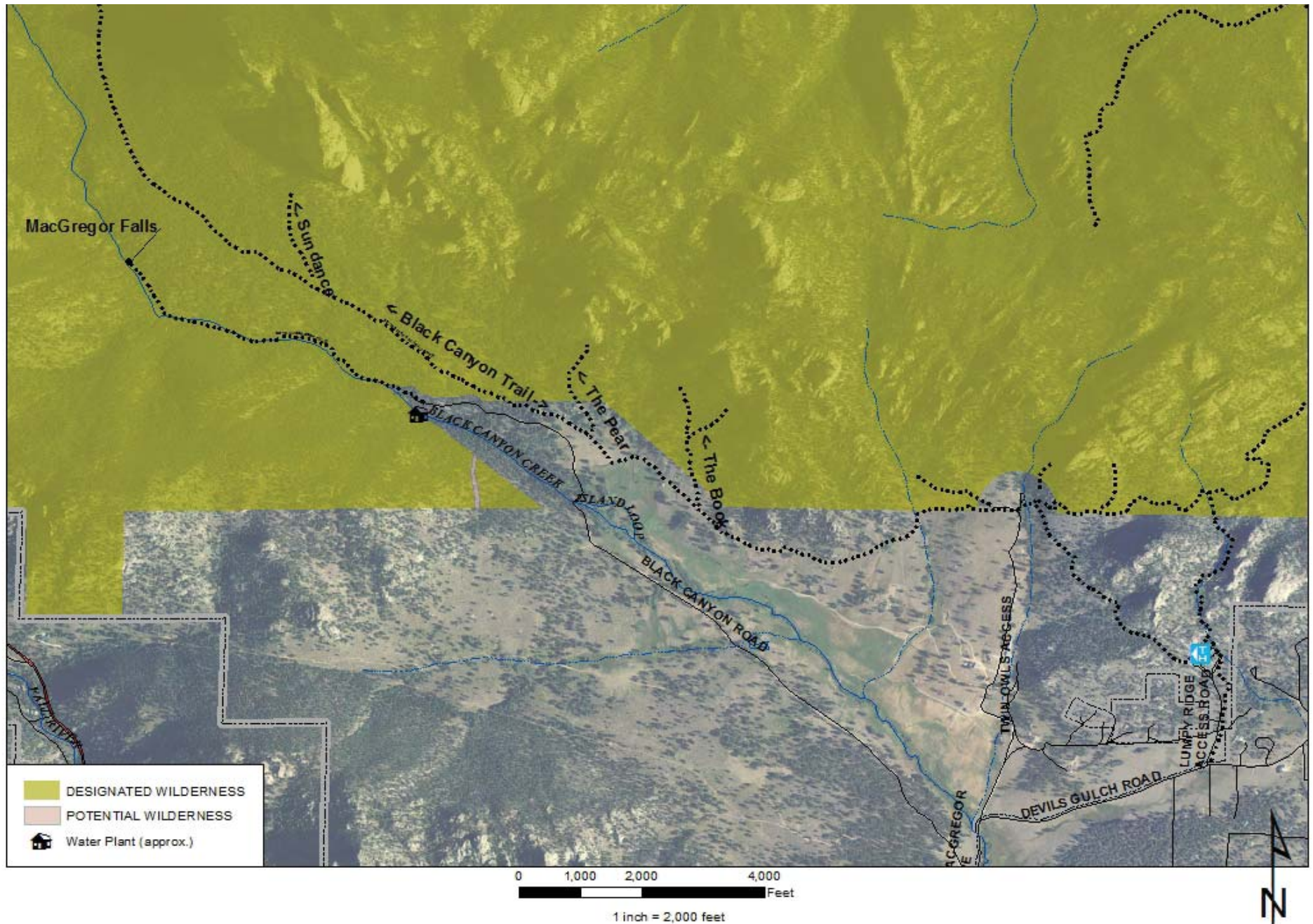
GIS Exports - Prevailing Cross Slope Map



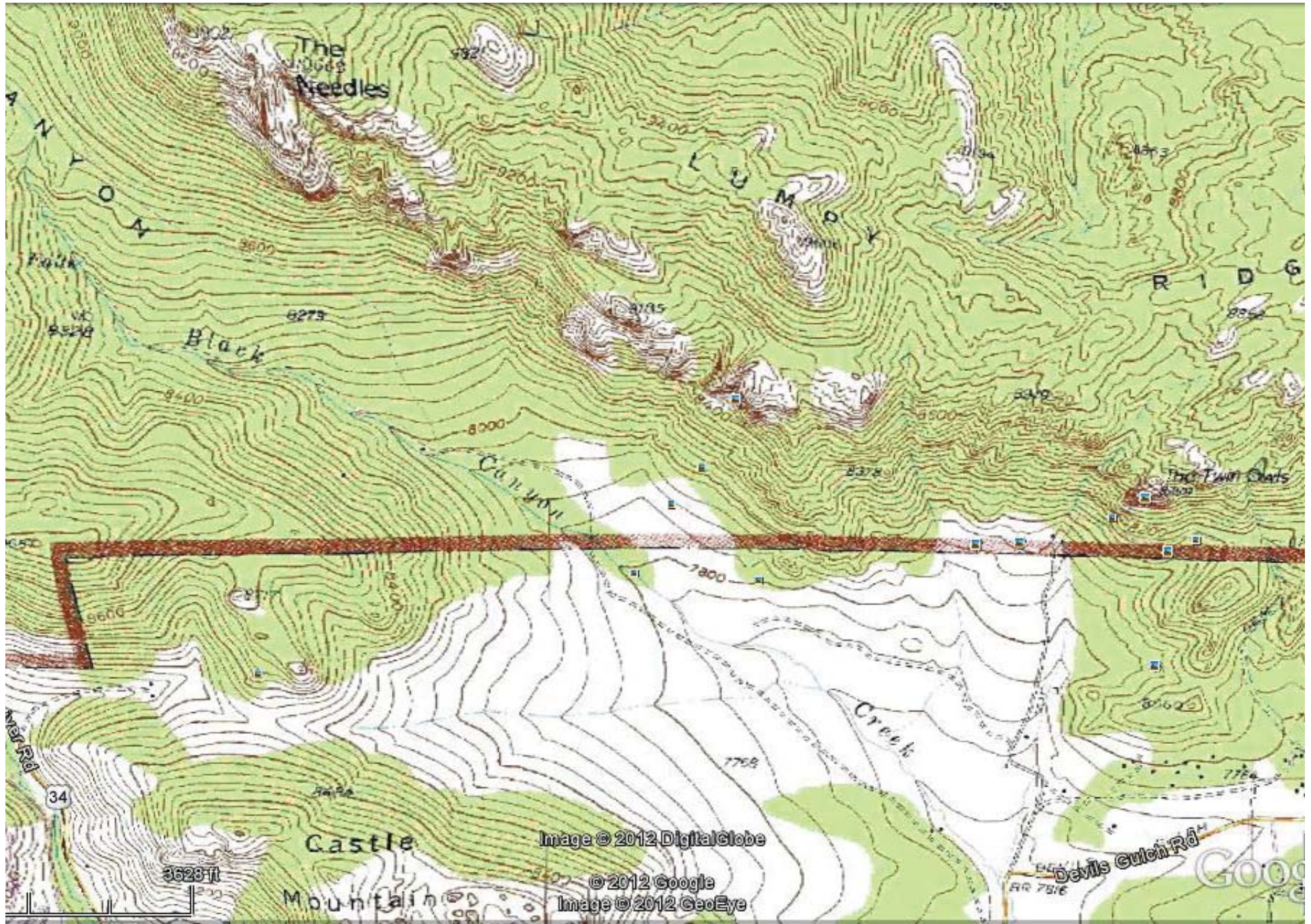


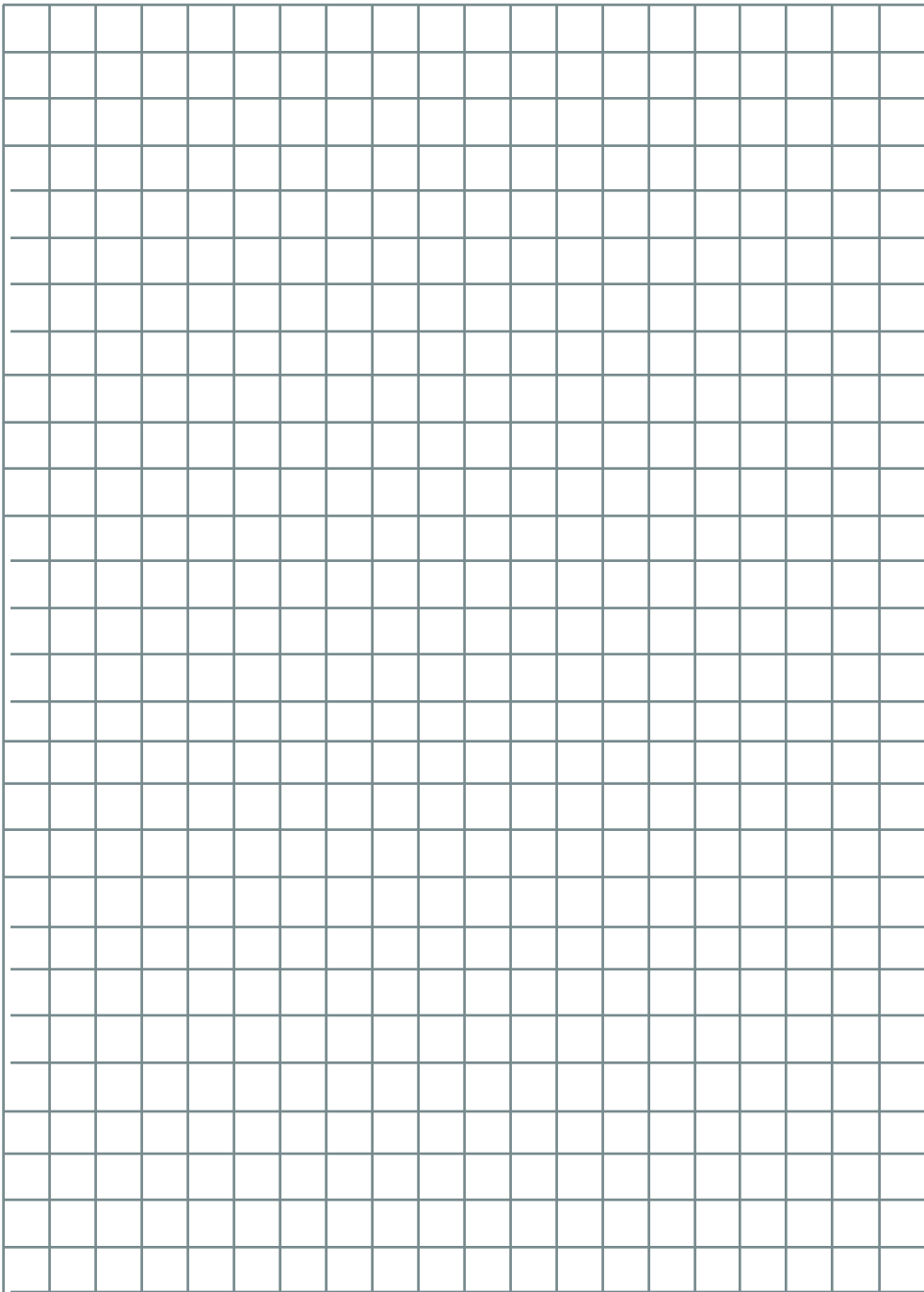
GIS Exports - Vegetation Map



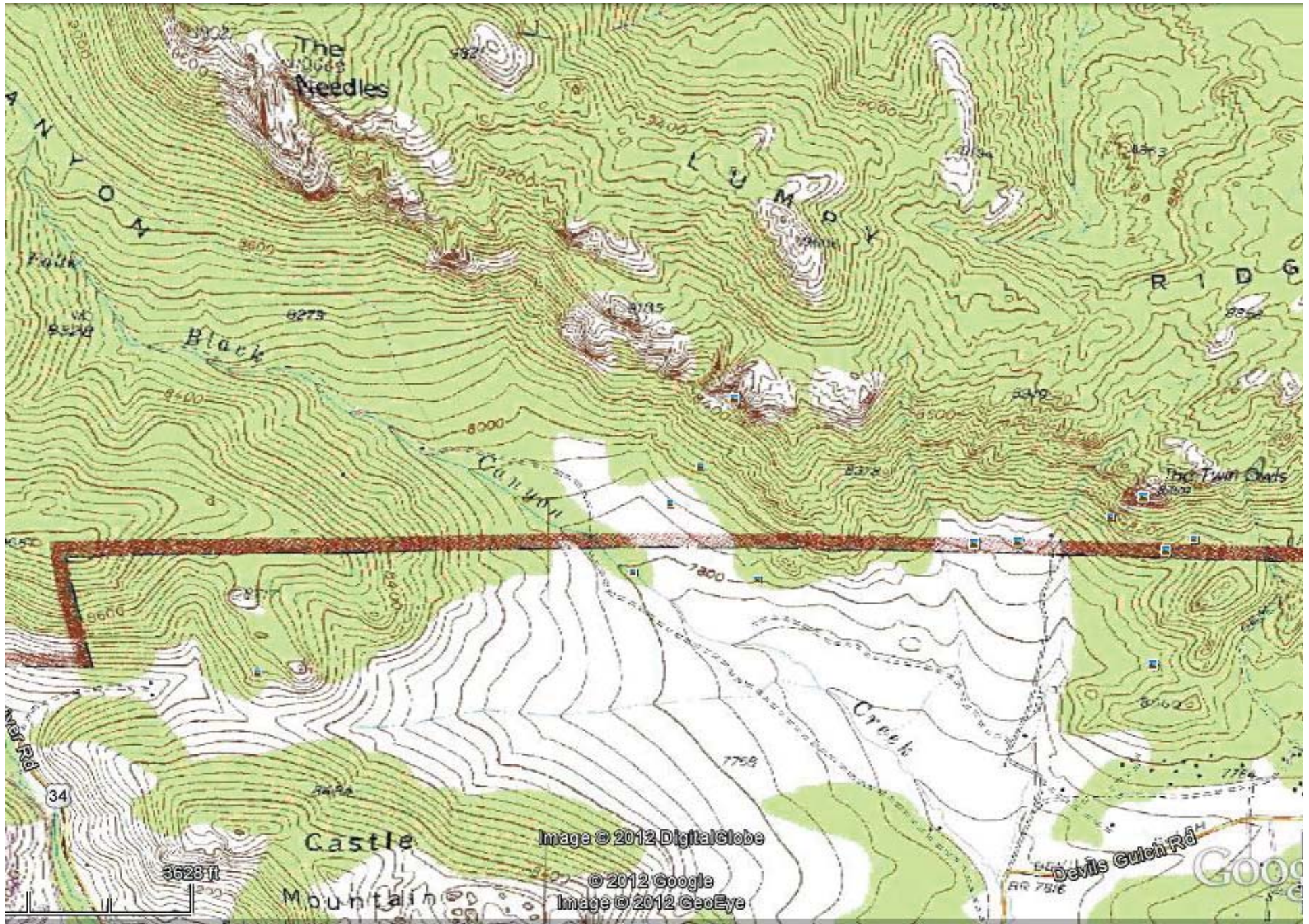


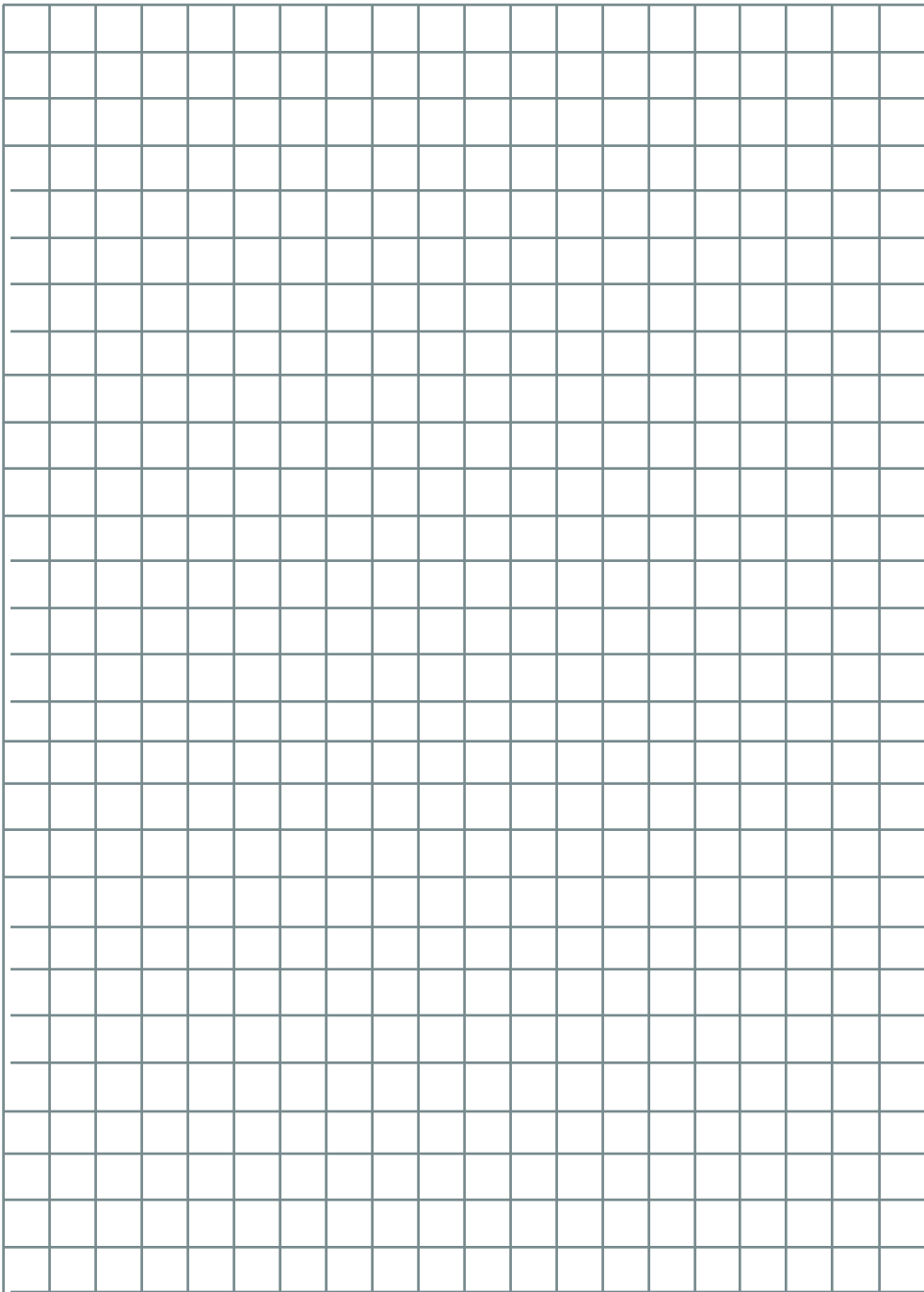
Characteristic Landscape Qualities



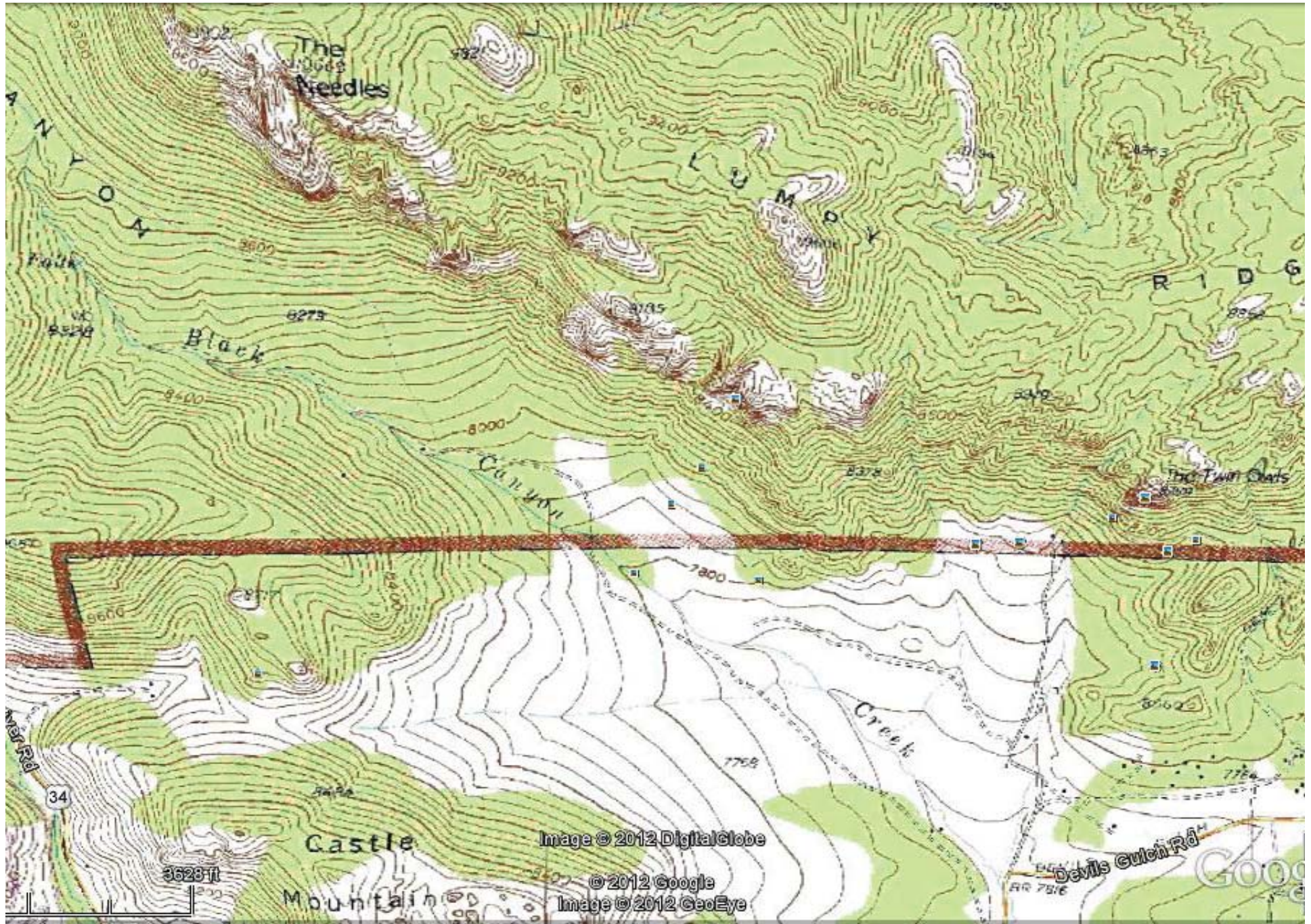


Site Analysis / Aesthetics / On-Site & Off-Site Views





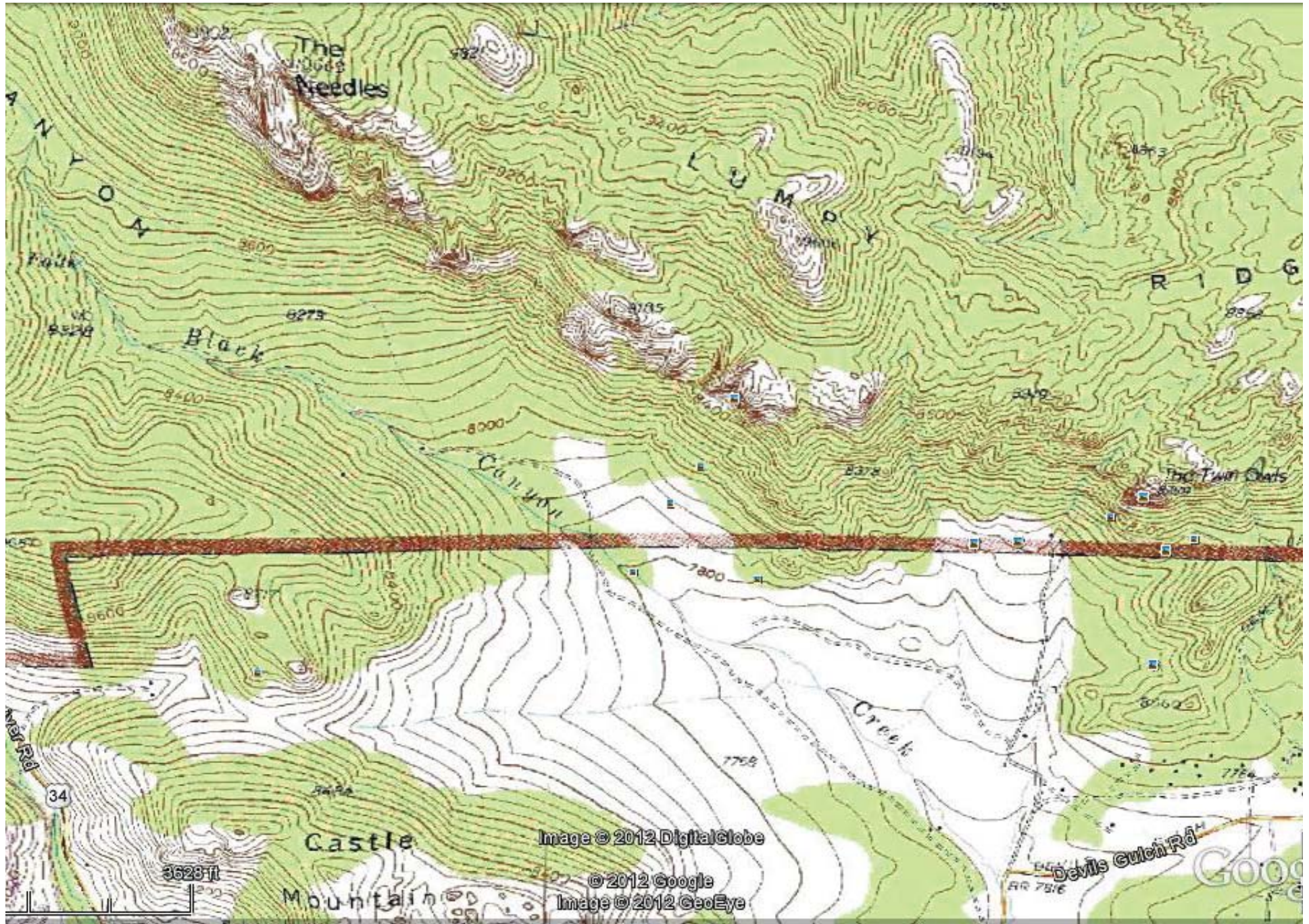
Appropriate Origins / Destinations / Corridor (Major) Control Points

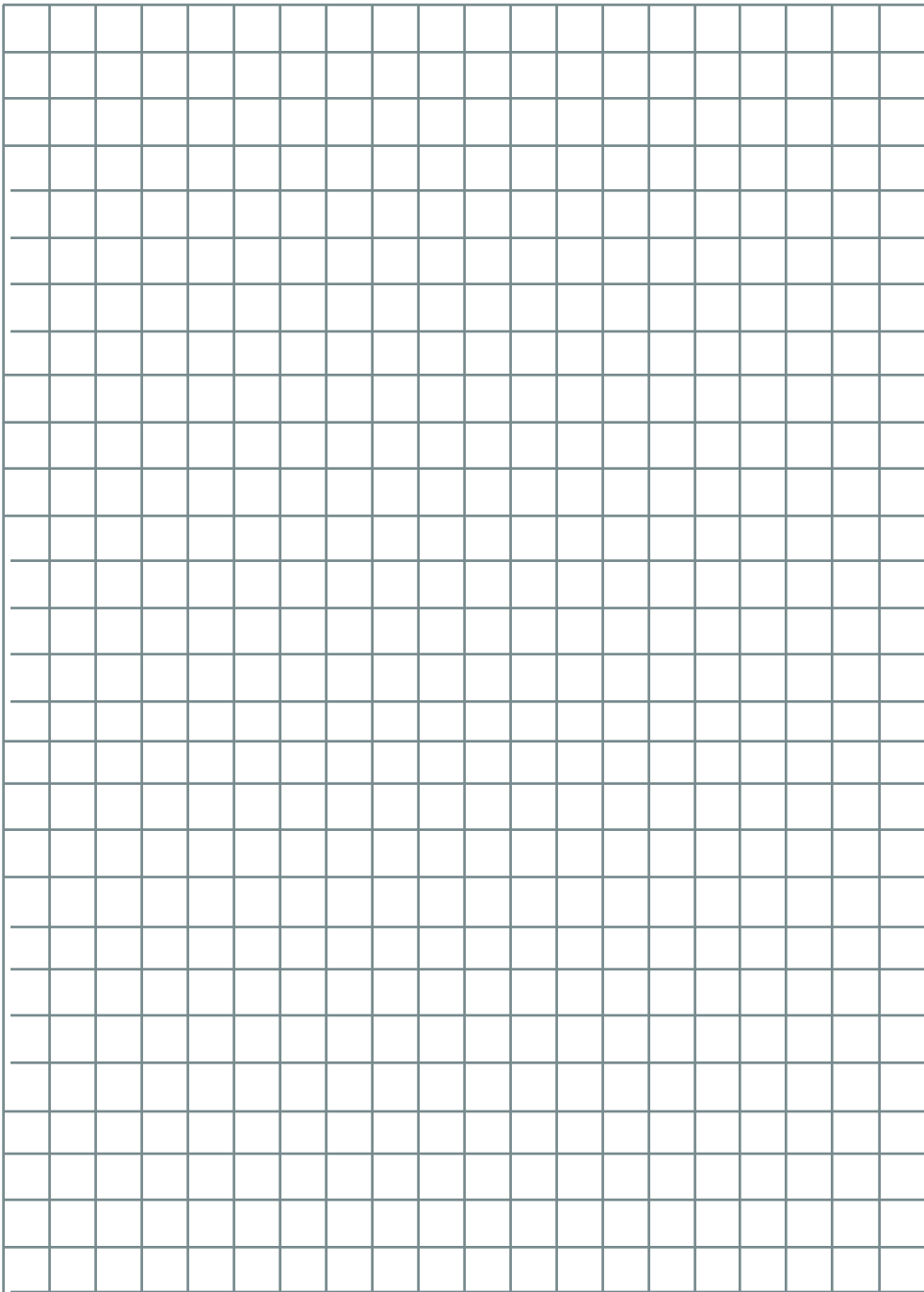


This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

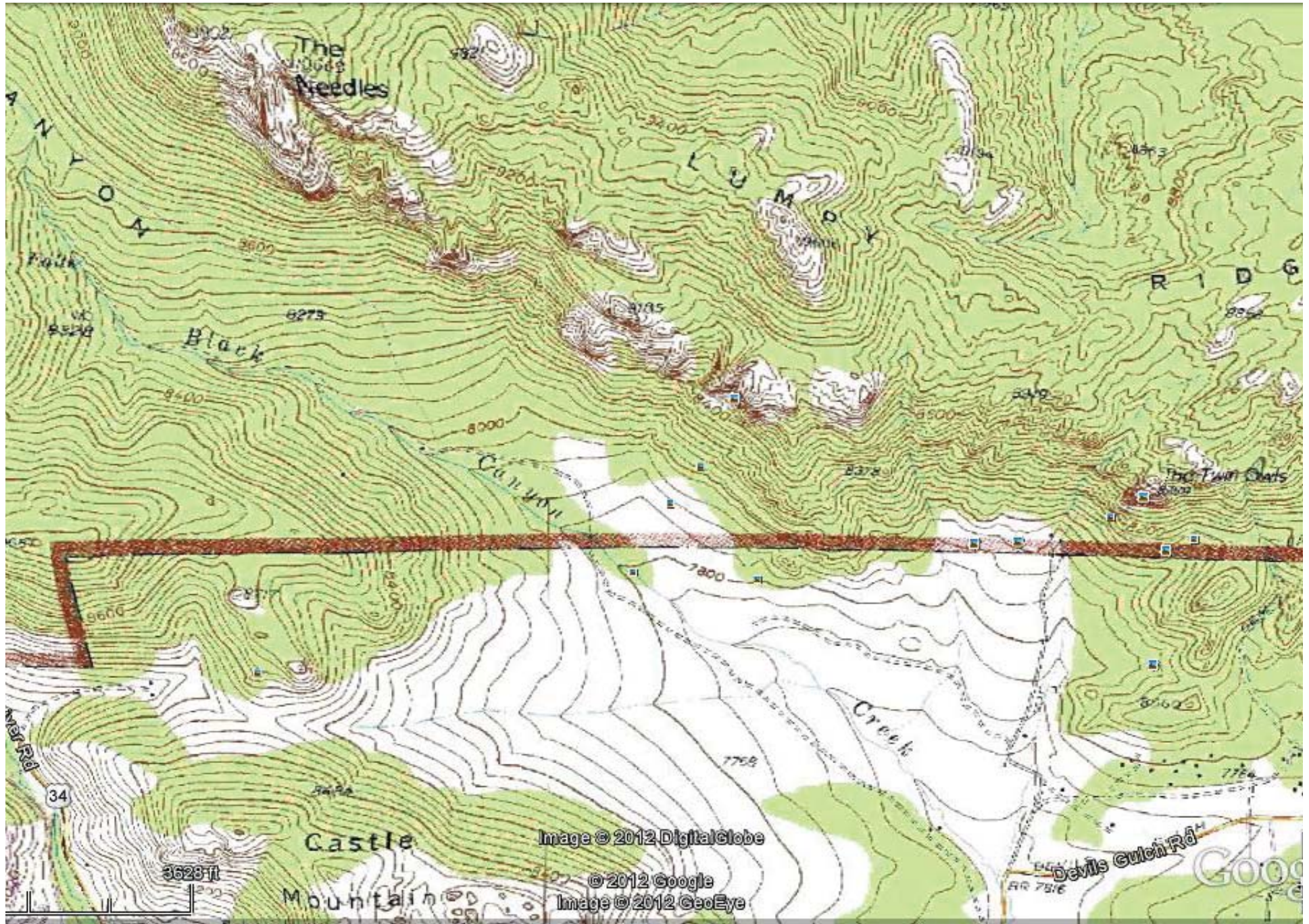
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Network Analysis / Off-Site Connections / Boundary Constraints



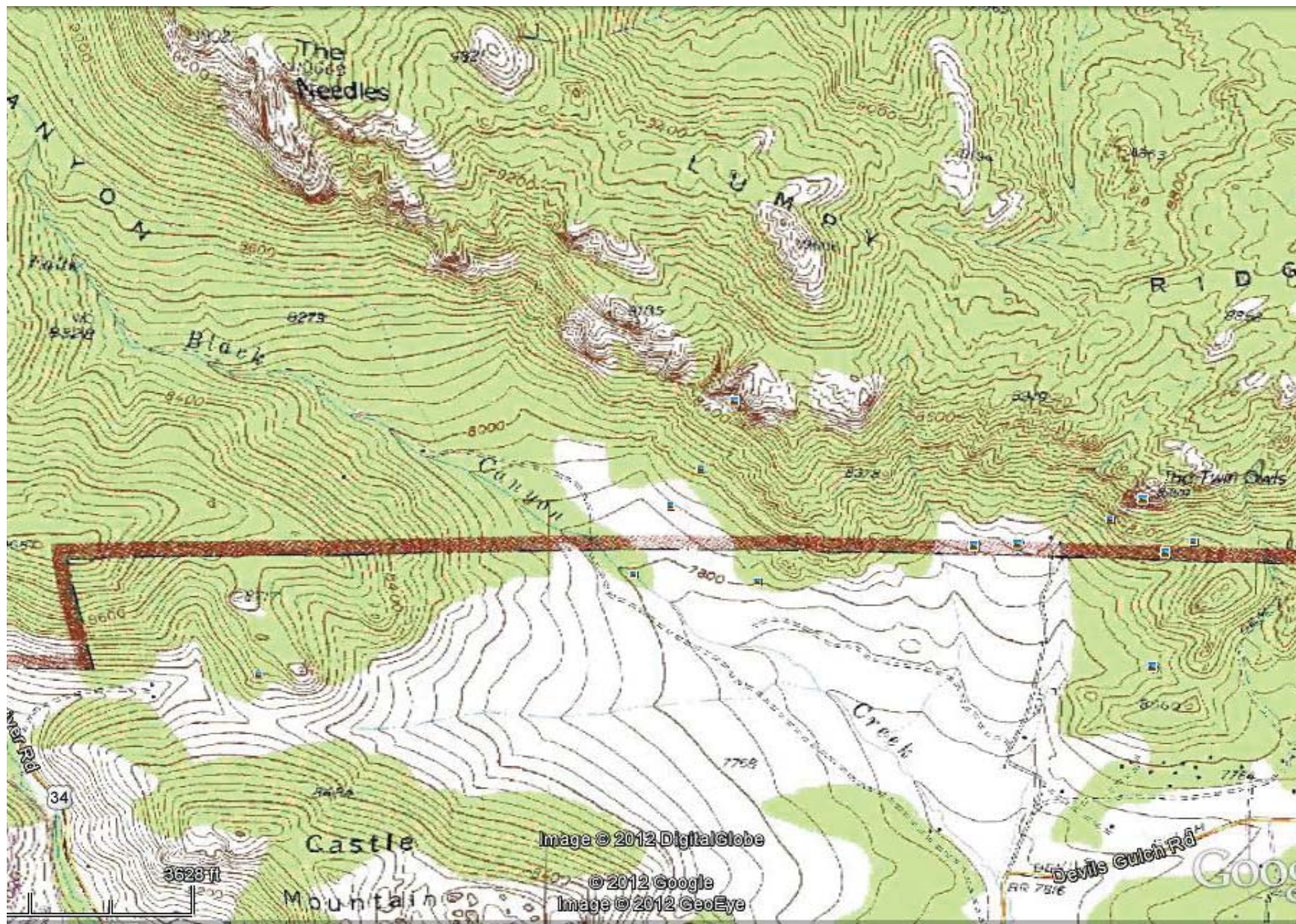


Educational / Interpretive Opportunities



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Alternative Framework # 1

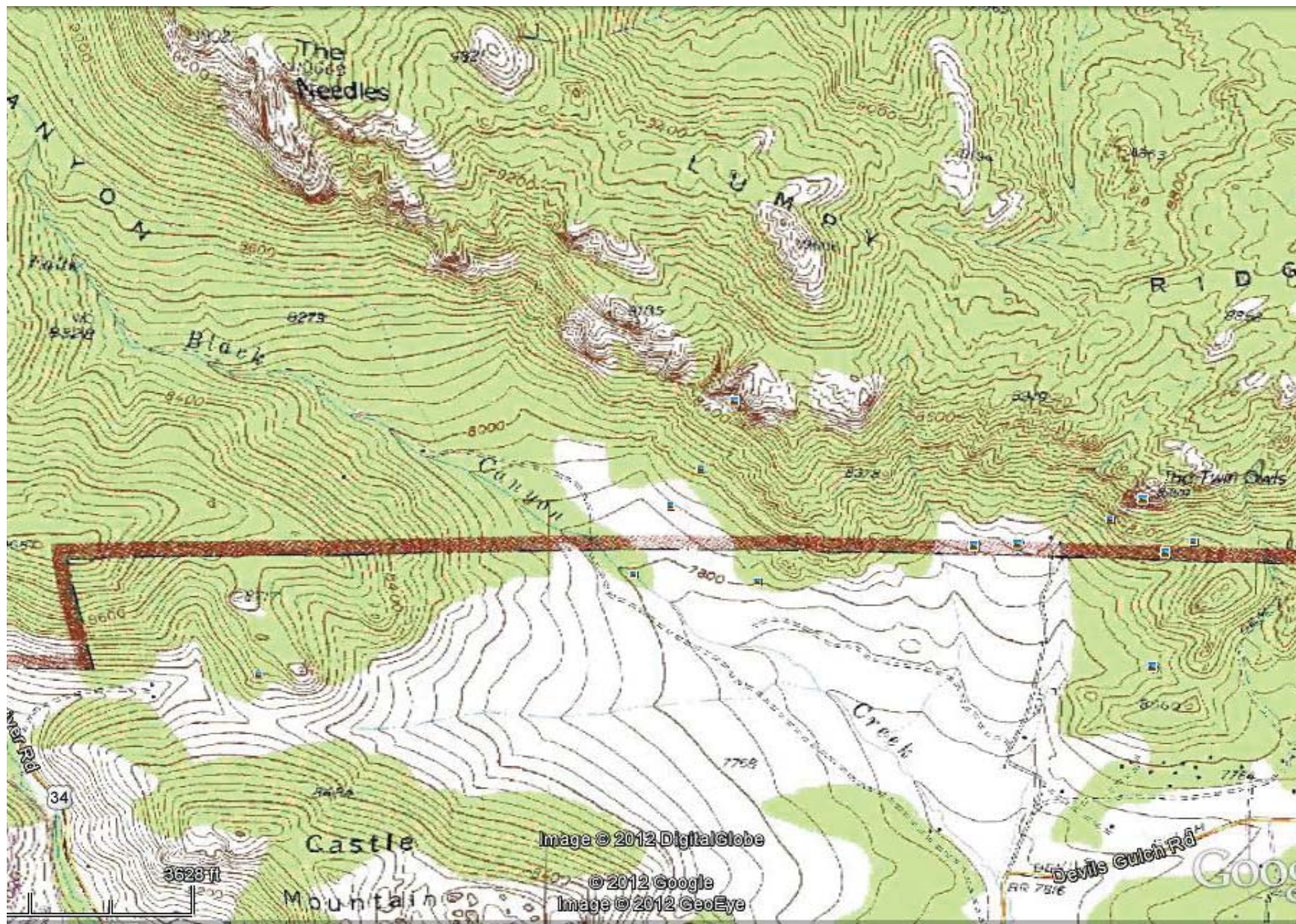


This image shows a full page of blank graph paper. The grid consists of small squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

$$G = D / L$$

33

Alternative Framework # 2

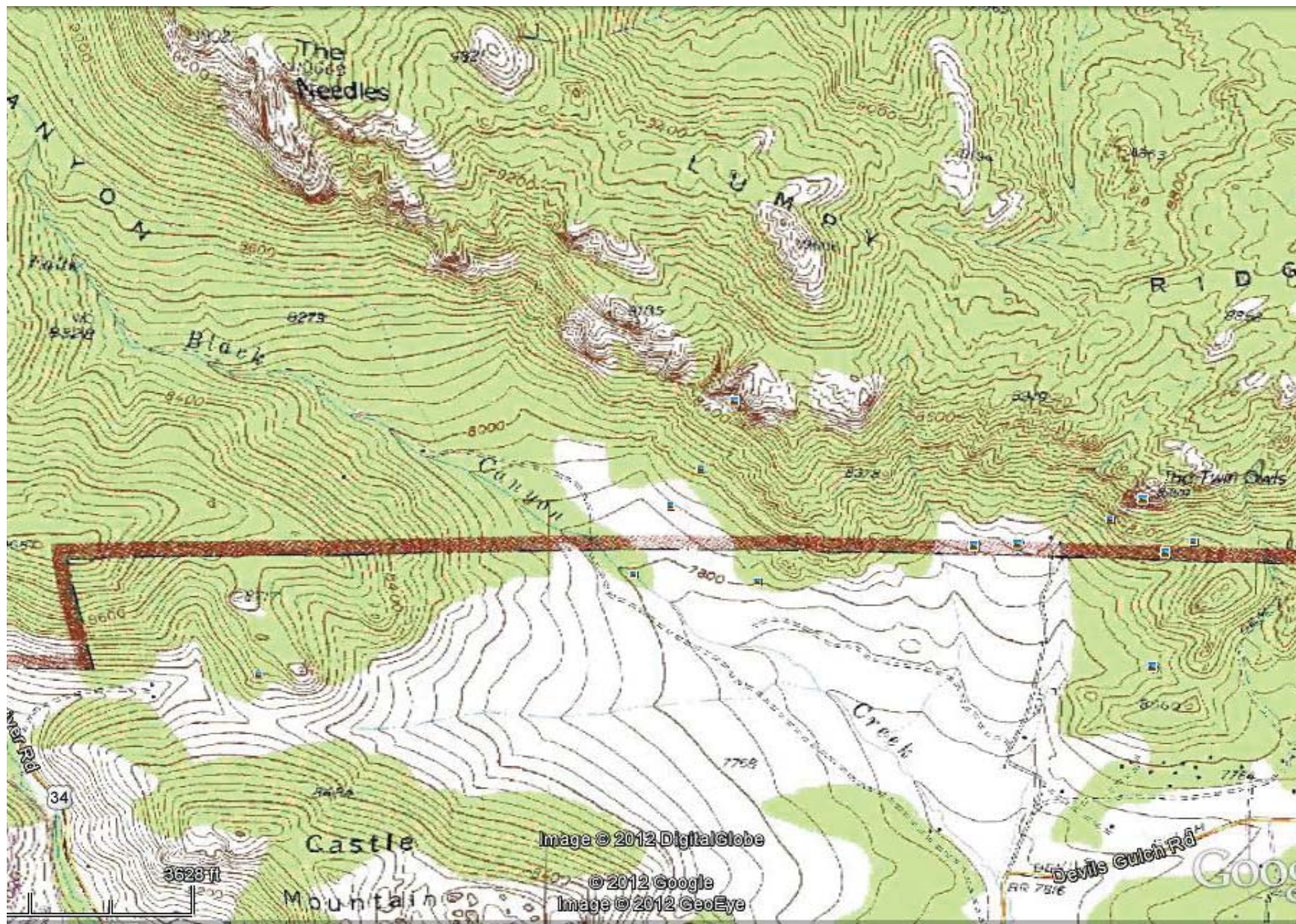


This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

$$G = D / L$$

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

Alternative Framework # 3



This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

$$G = D / L$$

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.

Assessment Notes _____

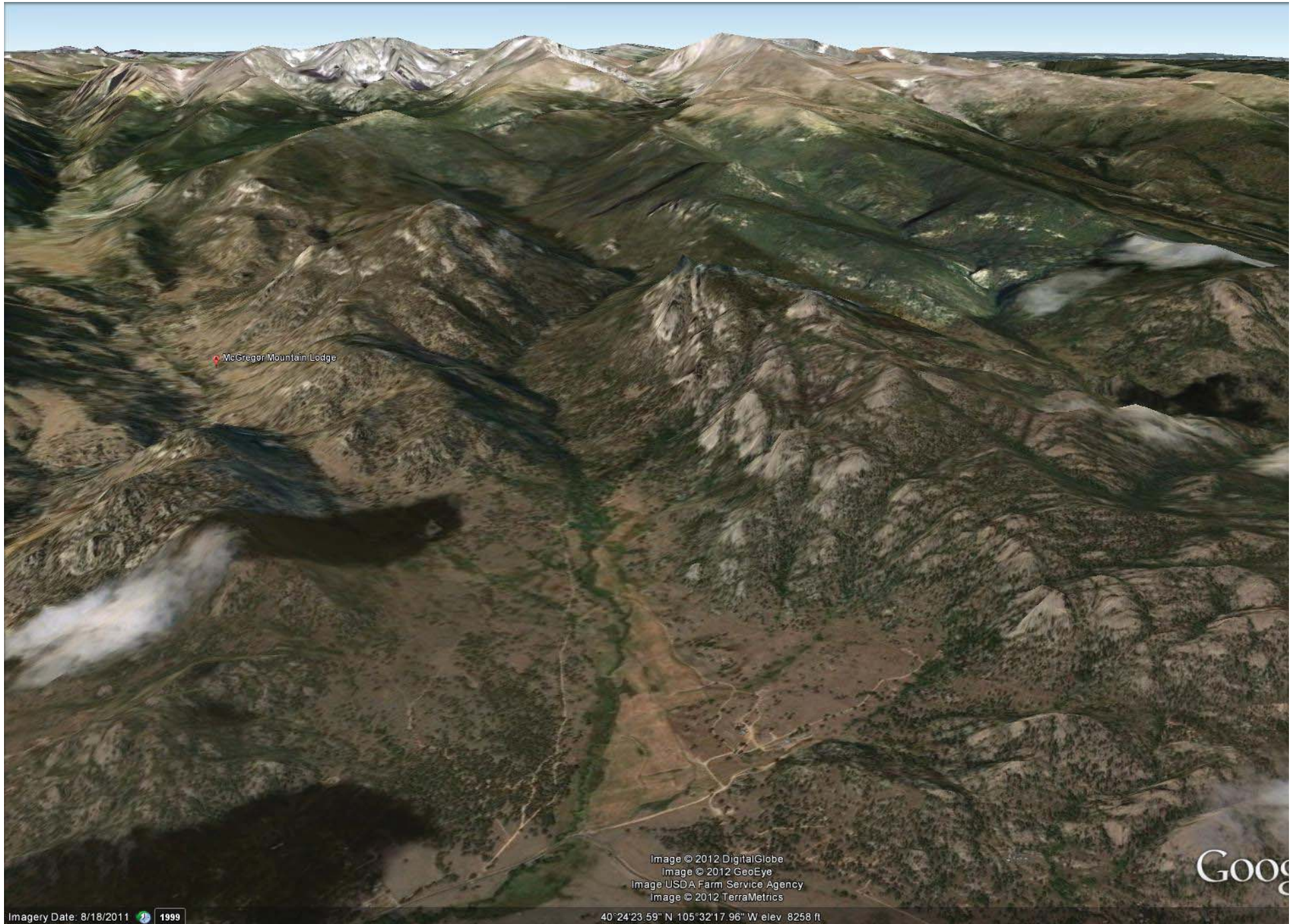
[illegible][illegible]38

New Trail Design Summary / Estimates

Estimates

Station	Cross Slope Left (%)	Cross Slope Right (%)	Profile Grade (%)	Azimuth	Soils	New Trail Design Notes / Mgt. Options

Google Earth Oblique Exports - 1



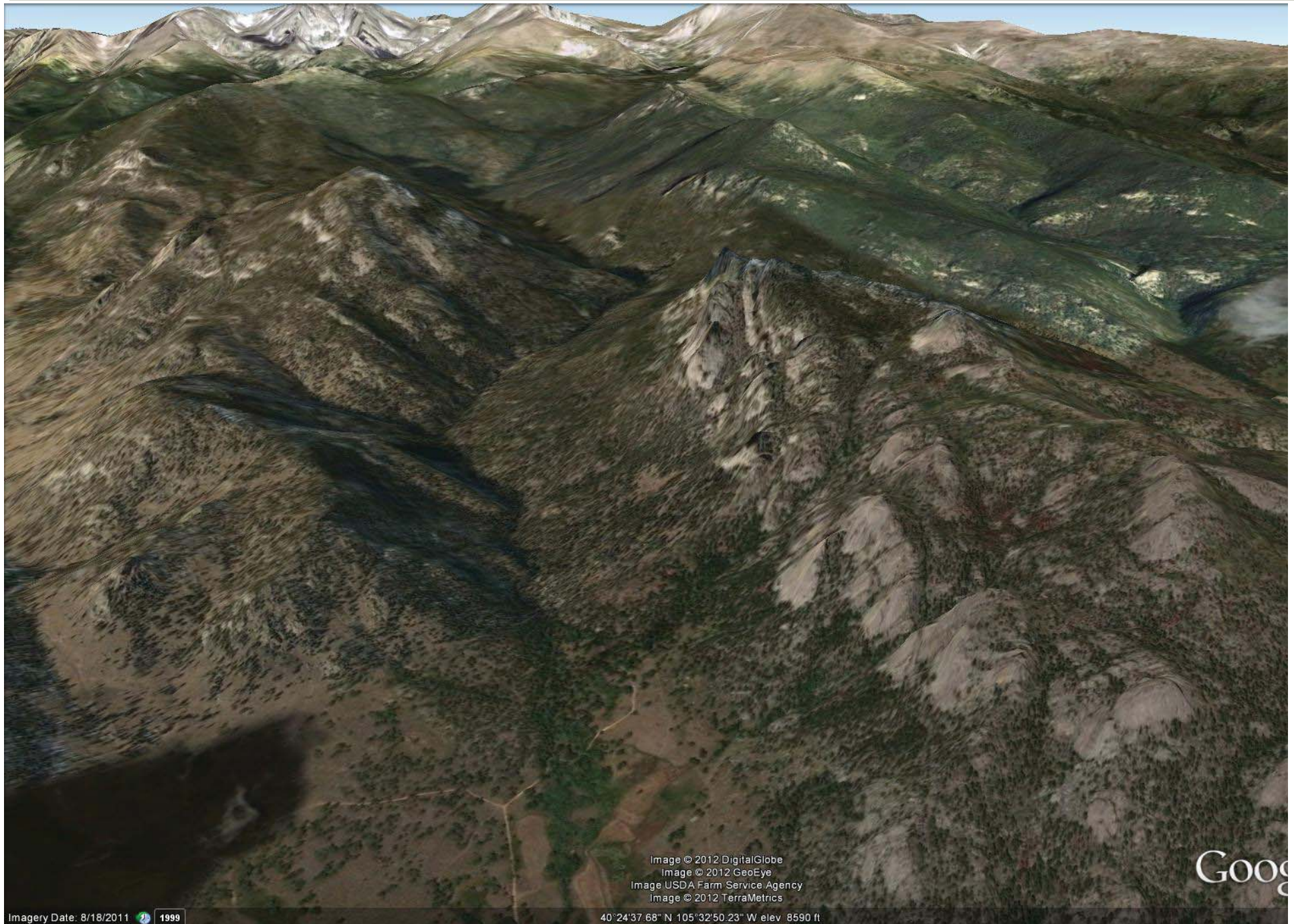


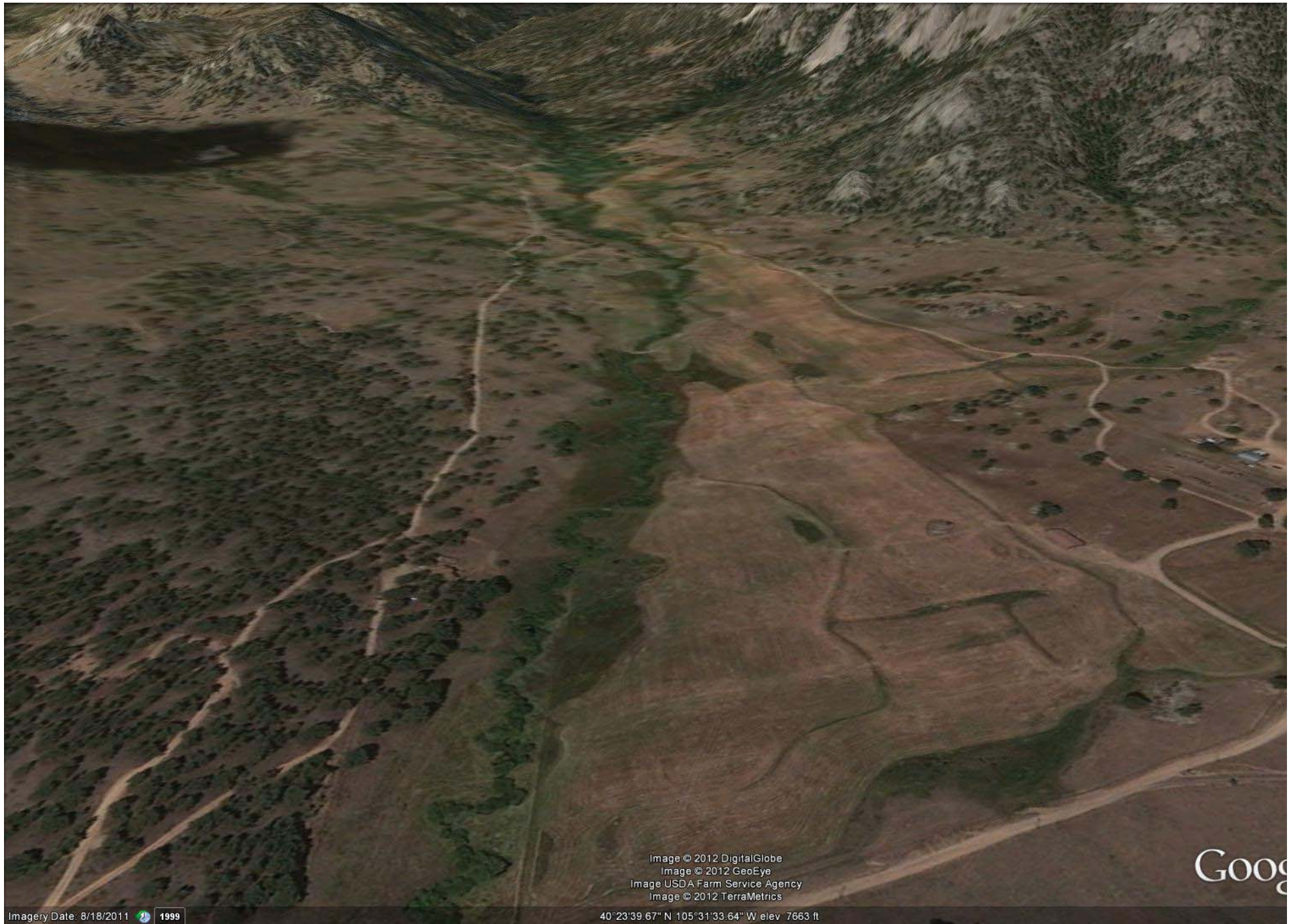
Image © 2012 DigitalGlobe
Image © 2012 GeoEye
Image USDA Farm Service Agency
Image © 2012 TerraMetrics

Google

Imagery Date: 8/18/2011 1999

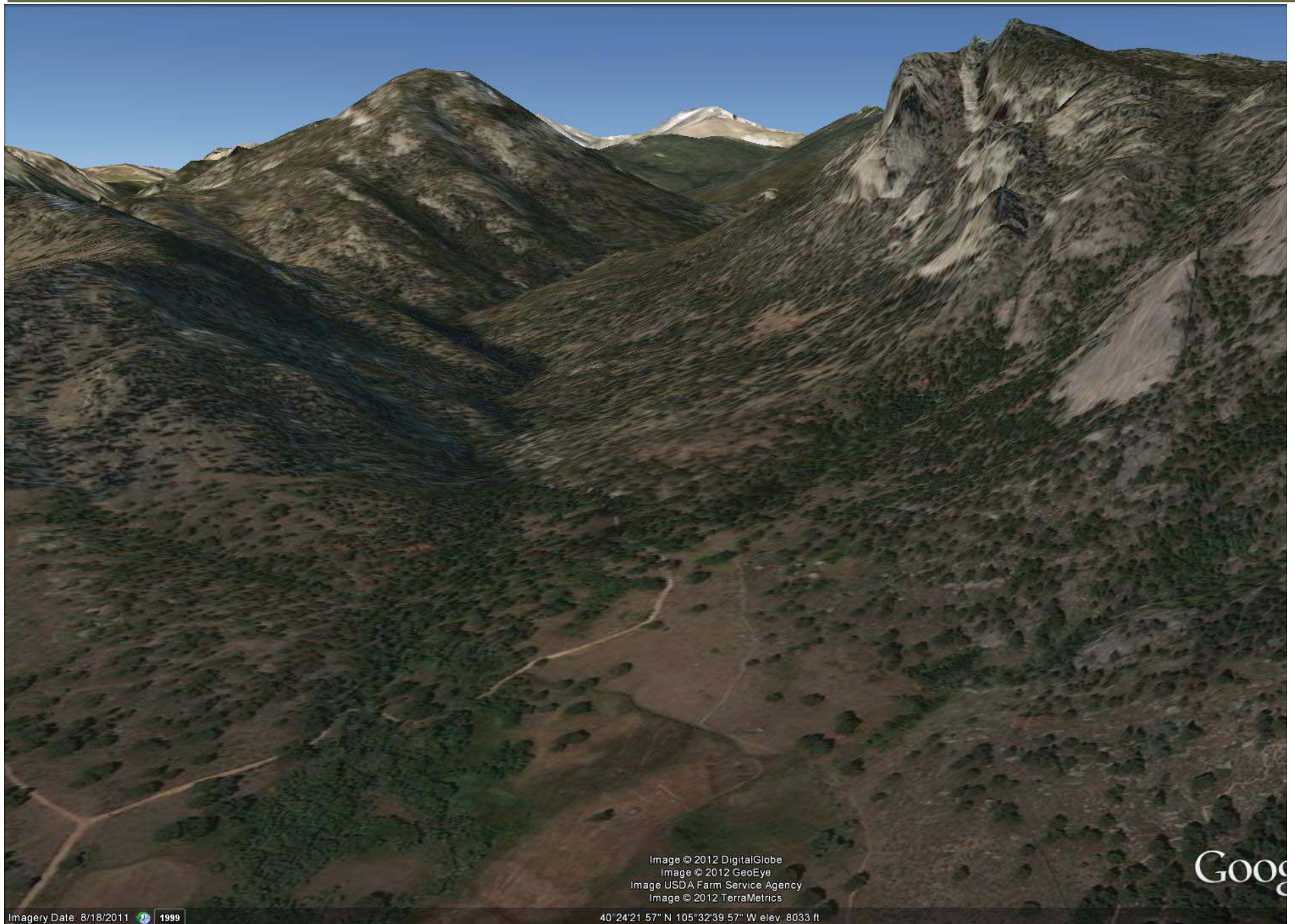
40°24'37.68" N 105°32'50.23" W elev 8590 ft

Google Earth Oblique Exports - 3



Imagery Date: 8/18/2011 1999

Image © 2012 DigitalGlobe
Image © 2012 GeoEye
Image USDA Farm Service Agency
Image © 2012 TerraMetrics
40° 23' 39.67" N 105° 31' 33.64" W elev 7663 ft



Restoration

Describe agency’s obligation to restore impacted areas _____

Describe benefits of performing restoration activities _____

Describe limitations on restoration activities (social, ecological, political, etc.) _____

Describe social considerations (using local materials, minimizing restrictive signage, budgetary constraints, aesthetics, inertia) of performing restoration activities _____

Describe ecological consideration (reducing invasion by non-native species, erasing the abandoned trail corridor scars, restoring natural drainage patterns, etc.) of performing restoration activities _____

Describe recommended restoration treatments (plugs, check dams, seeding, willow cuttings, recontouring, closure, etc.) _____

Estimated quantity in linear feet or square yards (ball park estimate) _____

4-Step Restoration Actions Sequence (outline only) _____

What benefit can salvaged native materials from trail construction be? _____

What benefit can salvaged native materials (i.e.: mineral soil or stone) from restoration activities be in trail construction? _____

Off-site (imported) materials (mulch, seeds, lumber, erosion matting, transplants, etc.) needed? _____

Describe restoration variables to monitor over time _____

What will happen if restoration is not accomplished on this site? _____

More Tools (Updated June 2012)

Appalachian Mountain Club

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Duffy, Hugh, Kim Frederick & Lois Bachensky

1991 *Sustainable Mountain Trail Corridors.* Denver, CO: Colorado State Trails Newsletter.

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1993 *Guiding Principles of Sustainable Design*. National Park Service: Denver Service Center. Denver, CO.
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Olmsted, Frederick Law

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2004 *Natural Surface Trails by Design*. Boulder, CO: Natureshape.

Parks Canada

1978 *Trails Manual*. Ottawa, Canada.

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2004 *Trail Construction and Maintenance Notebook, 2004 Edition*. Missoula, MT.
1995 *Landscape Aesthetics, A Handbook for Scenery Management*. Washington, D.C.
1994 *Forest Service Manual, 2600-Wildlife, Fish and Sensitive Plant Habitat Management*. Region 2.
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1984 *Trail Construction Manual*. Washington, D.C.
1986 *Standard Specifications for Construction of Trails (Publication Number EM 7720-102)*. Washington, D.C.
1972 *Forest Landscape Management Volume 1*. Washington, D.C.
1935 *Forest Trail Handbook*. Washington, D.C.
1923 *Trail Construction on the National Forests*. Washington, D.C.
1915 *Trail Construction on the National Forests*. Washington, D.C.

Vogel, Charles

1982 *Trails Manual, 2nd Edition*. Sylmar, CA: Equestrian Trails.



Hugh Duffy, National Park Service
Danny Basch, Rocky Mountain National Park
Kevin Dowell, Rocky Mountain National Park
Matt Martinez, Volunteers for Outdoor Colorado

Volunteers for Outdoor Colorado
Colorado Outdoor Stewardship Initiative
Rocky Mountain National Park



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