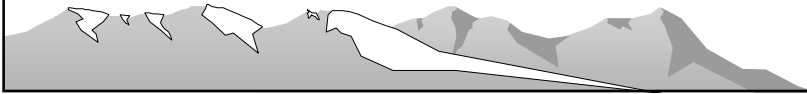




Oregon-California Trails Association

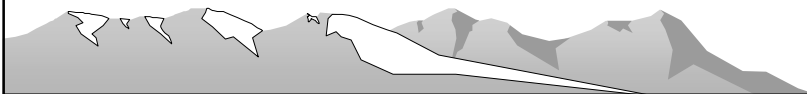
# MAPPING EMIGRANT TRAILS

Dave Welch  
Galva, KS  
July 17-18, 2010



## CONTENTS

- Overview
- Terminology
- Cardinal rules
- Evidence and Guidelines
- Techniques and Resources

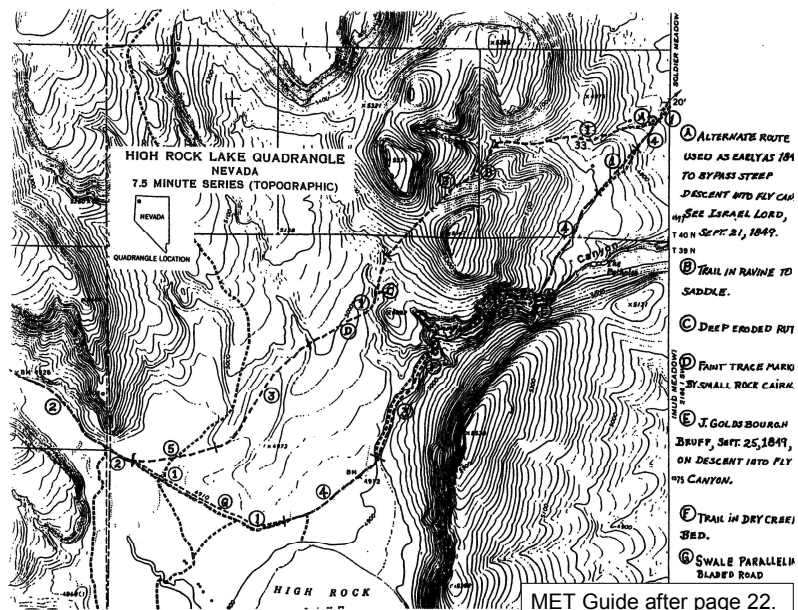


# OVERVIEW

- Objective:
  - Prepare a map with sufficient detail and credibility to support interpretation and preservation of the trail.
- Requirements:
  - Locate the trail on a map at a scale of 1:24,000 (quad)
  - Assess the condition of the trail
- Approach:
  - Paper maps and manual plotting of information
  - GPS and mapping software (separate presentation)
- Condition:
  - Cooperation of the landowner (public or private)



## MET MAPPING TECHNIQUES







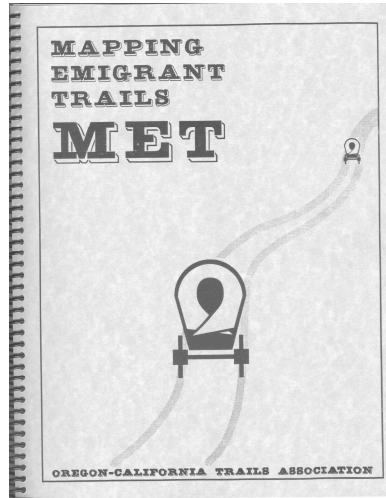
## HOW DO WE MAP EMIGRANT TRAILS?

- Search
  - Library and archives
  - On the ground
- Verify
  - Field evidence
  - Archaeological research
  - Contemporary documentation
- Document
  - Maps and data
  - Narrative

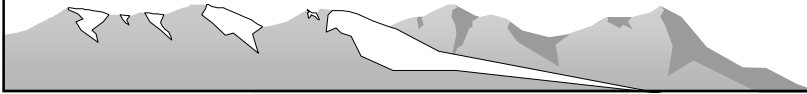


## MAPPING AS A PROCESS




- Mapping is an iterative process the goal of which is to maximize the probability that an historic trail has been found.
- Begins with research
  - Old maps
  - Diaries
  - Other research
- Preliminary field studies
  - What is on the ground?
  - How does it relate to the research
  - Preliminary mapping of all possibilities
- Re-evaluation of research
- Detailed mapping and classification
- Marking



Don Buck  
Andy Hammond  
David Johnson  
Tom Hunt  
John Maloney



## TRAIL TERMINOLOGY

<b>Trace</b>	General term for any original trail remnant.
<b>Depression</b>	Shallow dip in the surface, often very faint and difficult to see. 
<b>Swale</b>	A depression, but of deeper dimensions and with sloping sides. 
<b>Rut</b>	Deep depression, without a center mound and having steep sides. 

MET Guide page 16.



## TRAIL TERMINOLOGY

**Erosion Feature** A trace of any sort that has been deepened and altered by subsequent wind and/or water action. Sides and bottom often irregular.



**Track** Visible trace caused by compacting of surface or discoloration due to salt evaporation on alkali flats. Little or no depression. Often seen as streaks across an alkali flat.

**Scarring** Irregularly wide flat surface, devoid of vegetation, that no longer shows any wagon depressions or swales. Often seen trailing through sagebrush flats in an uneven pattern.

**Two-track** Parallel wheel tracks separated by center mound. Typically an unimproved ranch road used by motor vehicles.



**Improved Road or Secondary Road** Bladed, graded, crowned, gravelled, oiled, or blacktop roads usually having side berms, curbs or gutters.



MET Guide page 16.



## OREGON, CALIFORNIA AND MORMON PIONEER NATIONAL HISTORIC TRAILS





## TWO-TRACK IN WYOMING

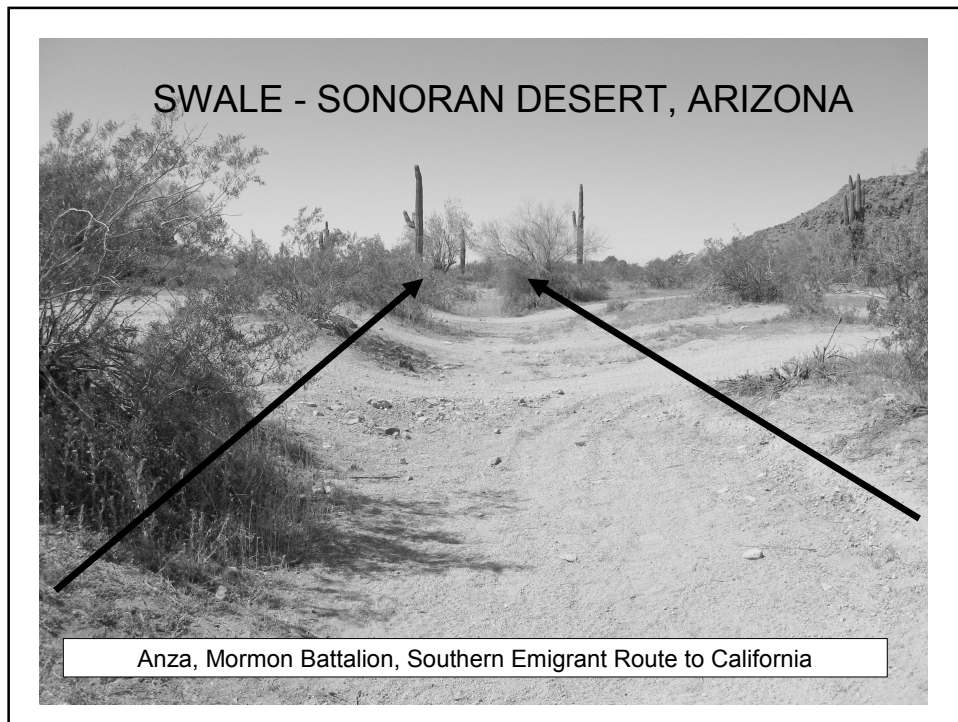


Photo by Randy Wagner



## TWO-TRACK AT SOUTH PASS, WY





## GENERAL PRINCIPLES OF TRAIL LOCATION & VERIFICATION

- Maximize Probability
  - Rarely are trails determined with absolute certainty
  - Maximize the likelihood of being right by using as many sources as possible
- Analogy
  - What is found should be consistent with what is already known



## CARDINAL RULES OF TRAIL VERIFICATION

- Coherence
- Corroboration
- Collateral
- Correlation

MET Guide page 5.



## CARDINAL RULES

### Coherence – Systematic Connection

There must be a linear uniformity so that trail segments form a continuous sequence; i.e., the trail segment under investigation has to link coherently with the trail segments that precede and follow it.

MET Guide page 4.



## CARDINAL RULES

### **Corroborate – To support with evidence or authority**

There must be confirming documentary evidence of the trail; i.e., the trail segment under investigation has to have valid written or cartographic evidence to support its authenticity.

MET Guide page 4.



## CARDINAL RULES

### **Collateral – Accompanying as second or subordinate; serving to support**

There must be accompanying physical and/or topographical evidence of a trail; i.e., the trail segment under investigation has to have some geomorphic or artifact evidence to support it as an authentic emigrant trail.

MET Guide page 4.



## CARDINAL RULES

### **Correlate – To establish a mutual or reciprocal relation**

There must be overall agreement between all types of evidence; i.e., the evidence resulting from the first three cardinal rules have to be mutually supporting (not contradicting one another) in order to verify the location of a trait segment.

MET Guide page 4.



## CARDINAL RULES OF TRAIL VERIFICATION

- Coherence – linear consistency
- Corroboration – supporting documentary evidence
- Collateral – other physical and/or topological evidence
- Correlation – overall agreement of all sources

MET Guide page 5.





## LIMITS OF THE CARDINAL RULES

- No set of standards, however well thought out, can cover all cases with equal uniformity.
- Ultimately, the trail mapper bears the responsibility of reaching a decision on where the trail is located. Others may disagree.

MET Guide page 4.



## RELIABILITY OF EVIDENCE

Generally, the closer in time the evidence is to the event, the more reliable it is.

- Written eyewitness accounts, if specific
- Remaining physical evidence
- General Land Office (GLO) cadastral surveys (earliest)
- Topographic limitations
- Reports and railroad surveys
- Early maps
- Recent documentation

MET Guide pages 4 through 7.



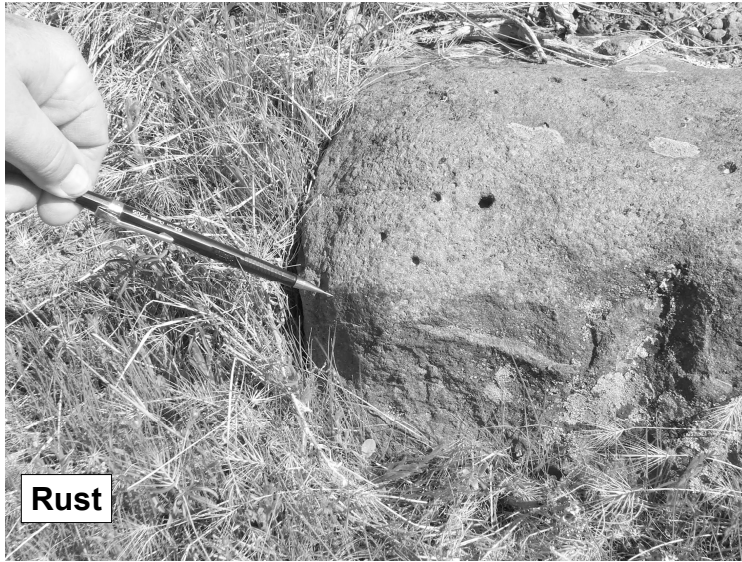
## GUIDELINES FOR LOCATING TRAILS

- Trails often follow ridgelines, not ravines or gullies
- Direct ascent of hills with resultant high erosion
- Multiple crossing of gullies and washes
- Trails avoided rocky terrain
- Spread out (parallel tracks) in alkali areas
- Swales and ruts more indicative of wagon trails than two tracks
- Artifacts may be concentrated at difficult points
- Rocks moved out of the trail path; broken rocks within trail corridor
- Varied vegetation growth
- Rust marks on granite; grooves on other stone
- Tree blazes and rub marks
- OCTA, BLM, NPS and other markers ☺

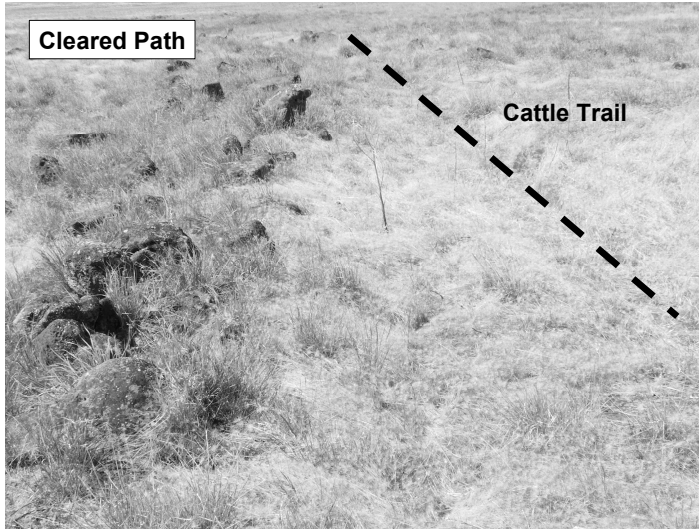
MET Guide pages 7 through 10



**Note:** Other evidence is consistent with these grooves being from wagon wheels.



**Rust**

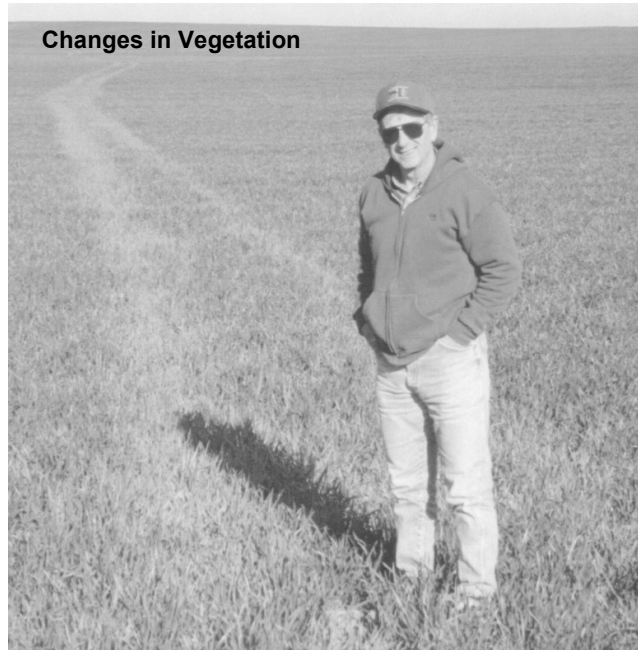


**Cleared Path**

**Cattle Trail**



**Gully Crossing**



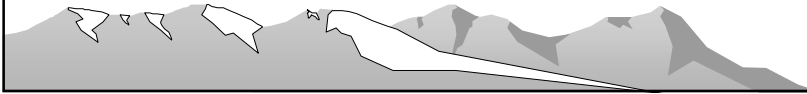
**Changes in Vegetation**



## SUMMARY: APPLICATION OF CARDINAL RULES

- Individually, the previous examples would not suffice to prove the presence of an historic trail.
- Collectively they provide strong evidence of a wagon road.
- What was the wagon road?
  - Emigrant trail
  - Stage road
  - Freighting road
  - Early highway

COMPOSITE METHODOLOGY



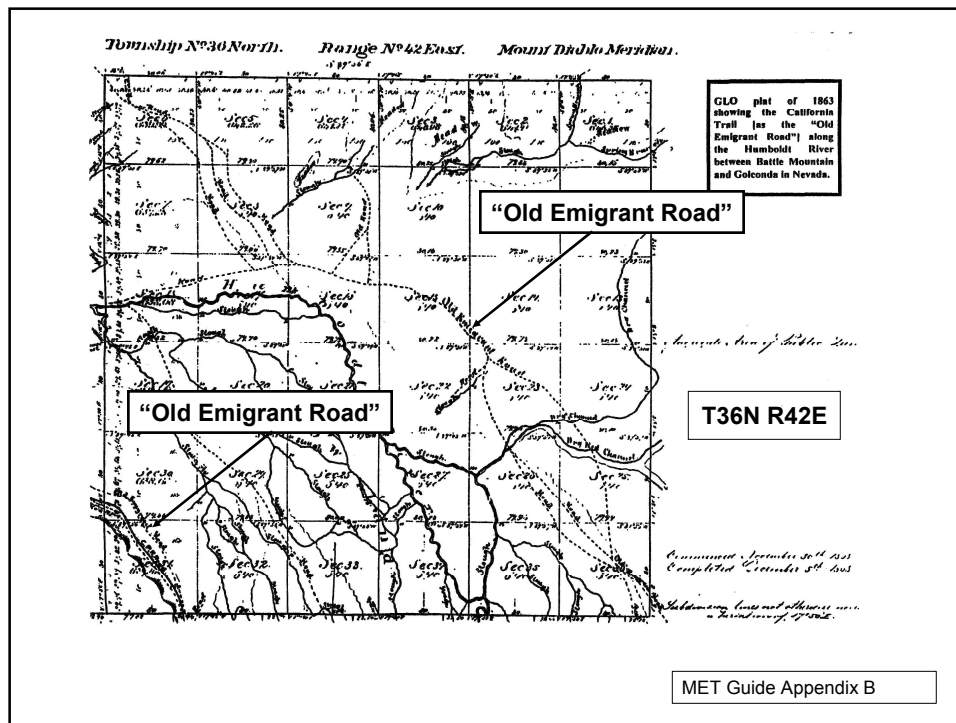
## MAPPING TECHNIQUES AND RESOURCES

- General Land Office (GLO) maps
- USGS maps
- Trail documents
- USGS maps
- Aerial and satellite photographs
- Online maps and images (Google, etc.)
- Global Positioning System (GPS)
- Mapping software
- Metal detectors

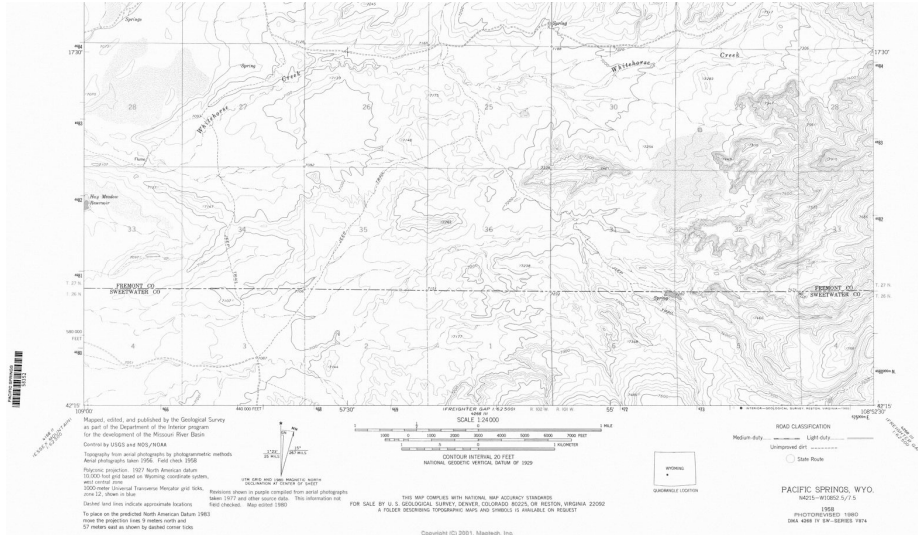


## METAL DETECTORS

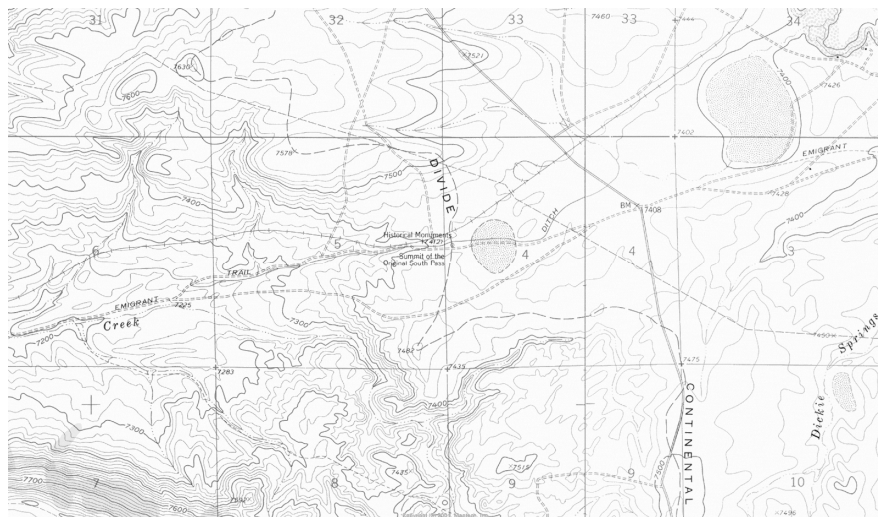
- Excavation of artifacts on public lands is illegal unless it is under the direction of a licensed archaeologist.
- Can be used with pin flags (no excavation) to outline possible trail route due to concentration of returns.



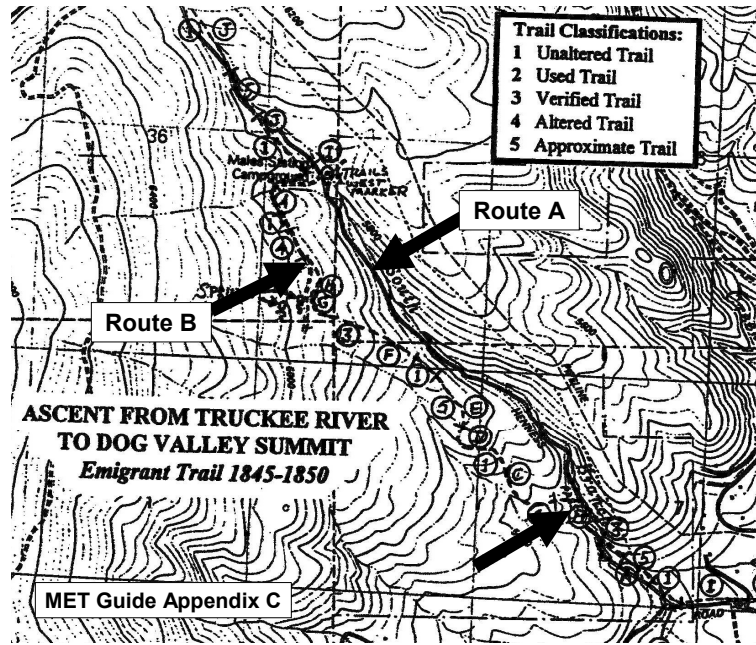
## USGS TOPOGRAPHIC QUAD 1:24,000 PACIFIC SPRINGS, WY



## USGS TOPOGRAPHIC QUAD 1:24,000 PACIFIC SPRINGS, WY



### USE OF TRAIL DOCUMENTS – DOG VALLEY EXAMPLE



## DOG VALLEY TRAIL DOCUMENTS

(See handout and MET guide for complete discussion)

### *Example 6 - Wakeman Bryarly: Aug. 20, 1849*

We started at daybreak & crossed the river [*Truckee River*]. The road turned immediately to the right in a north direction & continued for one mile, when it went in a northwest, ascending a spur of mountain, one of the chain of the California mountains. We ascended this [*the ridge immediately on the west side of the South Branch canyon*], it being in some places very steep, & then again coming upon a little table of land upon which had been good grass, & upon one with a cool but small spring. After rolling there 5 miles, we opened upon a beautiful little valley with a very steep hill to descend to it [*Dog Valley*].

DJW: Consistent with use of Route B. The table land and spring were located in field work.

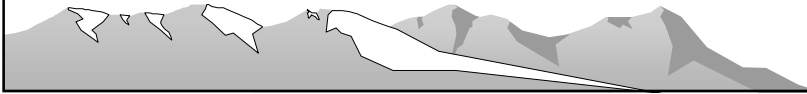






## SUMMARY

- When mapping, we
  - Are attempting to maximize the probability our interpretation is correct.
  - Need to apply an iterative process open to different interpretations.
  - Need to begin with historical research.
  - Need to be aware of the subjective nature of the process.



## REMINDERS

All field activities (like mapping) need to be conducted with the permission of the landowner. This applies to both private and public lands.

GPS-quality information on the location of cultural resources should not be placed in the public domain.

