



Oregon-California Trails Association

Mapping Emigrant Trails

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Phoenix, AZ
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MAPPING
EMIGRANT
TRAILS
MET

OREGON-CALIFORNIA TRAILS ASSOCIATION

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Trail Terminology

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

MET Guide page 16.

Class 1 Rut – Guernsey, WY





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.

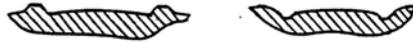
Two-track

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.



How Do We Map Emigrant Trails?

- Search
- Verify
 - Field evidence
 - Archaeological research
 - Contemporary documentation
- Document
 - Plot on USGS Quads or equivalent
 - Field surveys (Global Positioning System)
 - Results of historical research



General Principles of Trail Location and 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

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



PHYSICAL EVIDENCE



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



PHYSICAL EVIDENCE



Rust



PHYSICAL EVIDENCE



Cleared Path

Cattle Trail

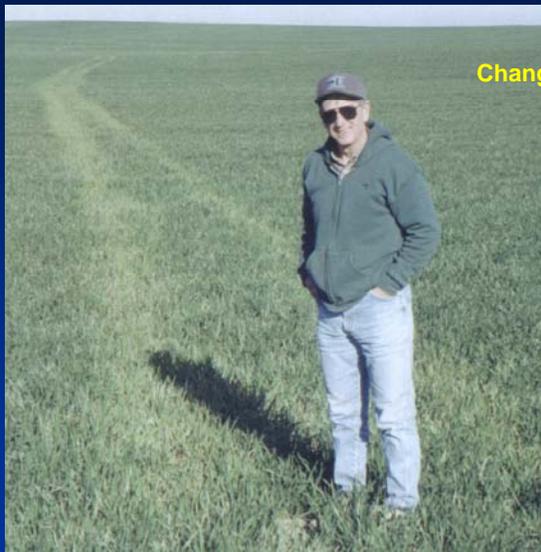


PHYSICAL EVIDENCE



Gully Crossing

PHYSICAL EVIDENCE



Changes in Vegetation



Coherence and Correlation

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

Composite Methodology



Trail Classifications

- Class 1: Unaltered Trail
- Class 2: Used Trail
- Class 3: Verified Trail (but non-existent)
- Class 4: Altered Trail
- Class 5: Approximate Trail

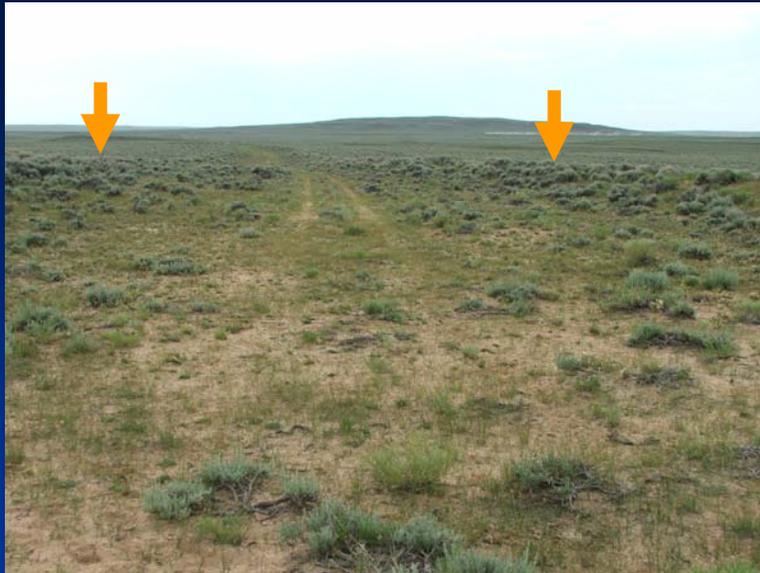


Trail Classifications

Class 1: Unaltered Trail Symbol: ①

Description: The trail retains the essence of its original character and shows no evidence of having been either impacted by motor vehicles or altered by modern road improvements. There is visible evidence of the original trail in the form of depressions, ruts, swales, tracks, or other scars, including vegetative differences and hand-placed rock alignments along the trailside.

MET Guide page 13.



Big Sandy Swales Class 1 (Class 2 within trail corridor)



Class 1

Anza Trail, Mormon Battalion Route and Butterfield Stage Road



Class 1



Trail Classifications

Class 2: Used Trail

Symbol: ②

Description: The trail retains elements of its original character but shows use by motor vehicles, typically as a two-track road overlaying the original wagon trail. There is little or no evidence of having been altered permanently by modern road improvements, such as widening, blading, grading, crowning, or graveling. In forested areas the trail may have been used for logging but still retains elements of its original character.

MET Guide page 13.

South Pass (Class 2)



Note: Parallel trails in the area, some of which are Class 1.



Trail Classifications

Class 3: Verified Trail

Symbol: ③

Description: The trail route is accurately located and verified from written, cartographic, artifact, topographical, and/or wagon wheel impact evidence (as rust, grooved, or polished rocks), but due to subsequent weathering, erosion, vegetative succession, or logging, trail traces will be nonexistent or insignificant what does remain is a verified trail corridor with no intrusive modern development. Typically this includes trails that once passed through forests and meadows, across excessively hard surfaces or bedrock (such as on ridges), over alkali flats and sandy soil, and through ravines or washes.

MET Guide page 14.



Class 3: ...but due to subsequent weathering, erosion, vegetative succession, or logging, trail traces will be nonexistent or insignificant what does remain is a verified trail corridor with no intrusive modern development.



Trail Classifications

Class 4: Altered Trail

Symbol: ④

Description: The trail location is verified but elements of its original condition have been permanently altered, primarily by road construction, such as widening, blading, grading, crowning, graveling, or paving. In some cases, the original trail has been permanently altered by underground cables and pipelines.

MET Guide page 14.

Class 4 – Altered Trail



Class 2 and Class 4 (Beyond Fence)



Trail Classifications

Class 5: Approximate Trail

Symbol: ⑤

Description: The trail is either so obliterated or unverifiable that its location is known only approximately. In many cases, the trail has been destroyed entirely by development, such as highways, structures, agriculture, or utility corridors. In others, it has been inundated beneath reservoirs, in some, there is not enough historical or topographic evidence by which to locate the trail accurately. Thus, only the approximate route is known.

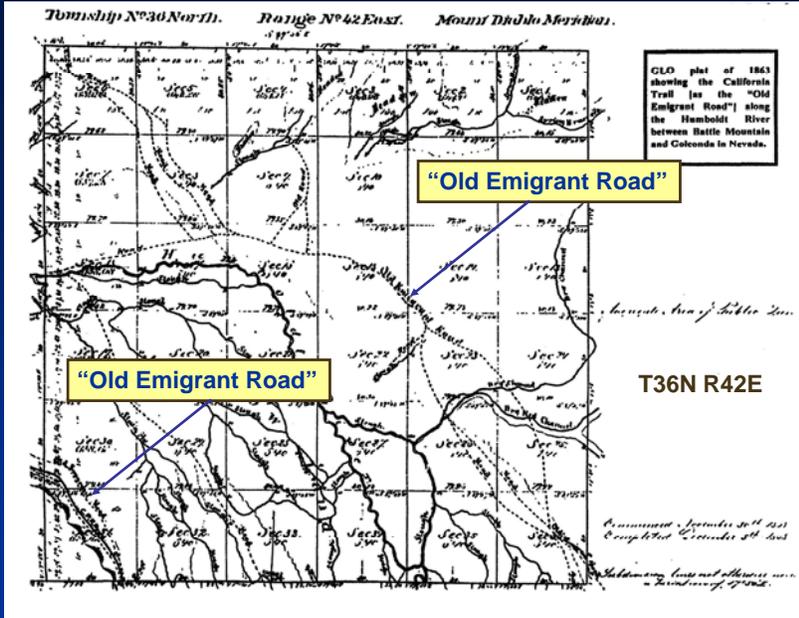
Class 5

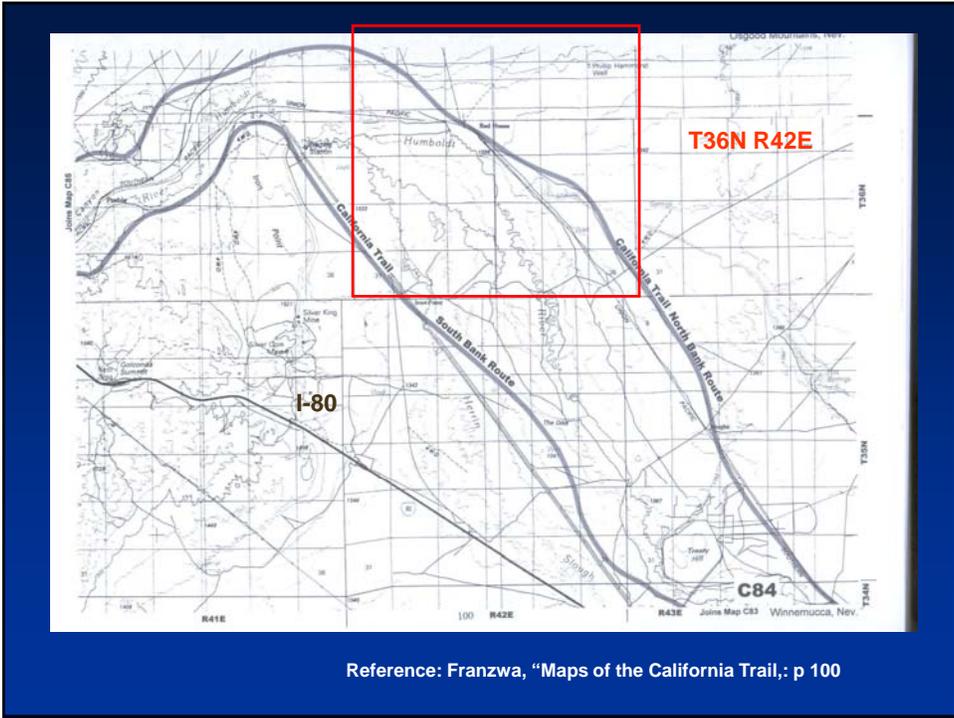


Differentiating Classes 3, 4 and 5

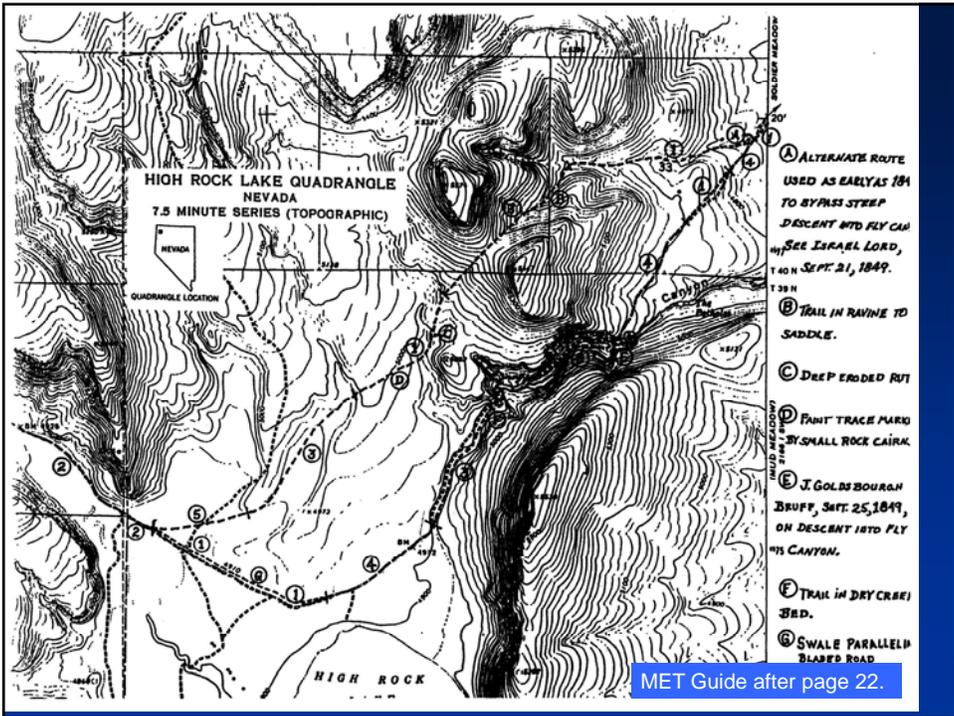
- Classes 3, 4 and 5 indicate “altered” trail.
- Class 3 is altered by nature. The trail route is known but not visible.
- Class 4 and 5 are altered by man.
- Class 5 is a severe case of Class 4.

Mapping

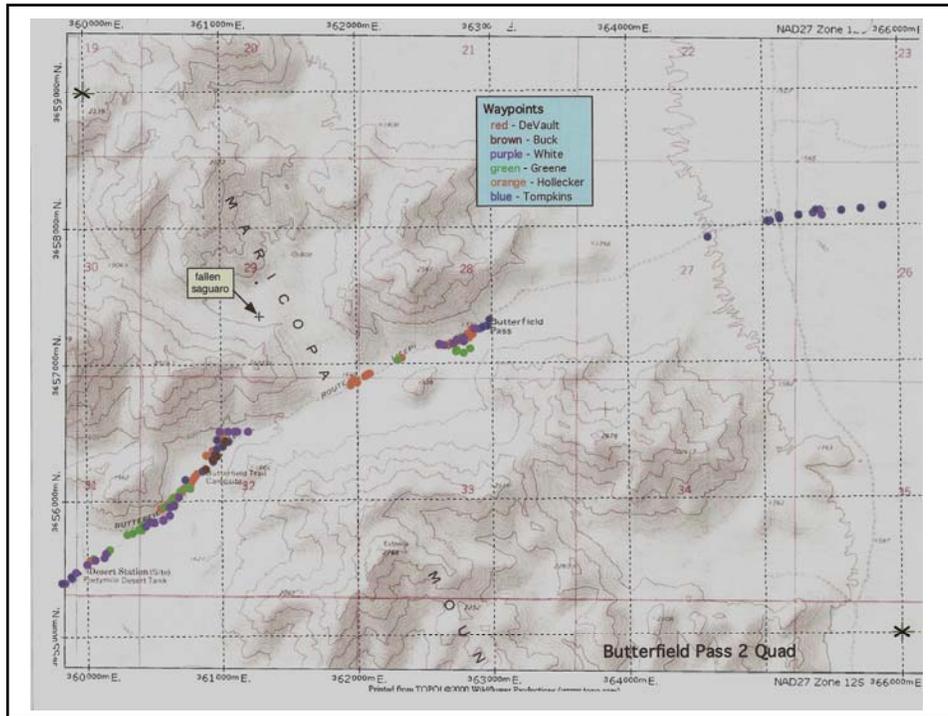




Reference: Franzwa, "Maps of the California Trail,": p 100



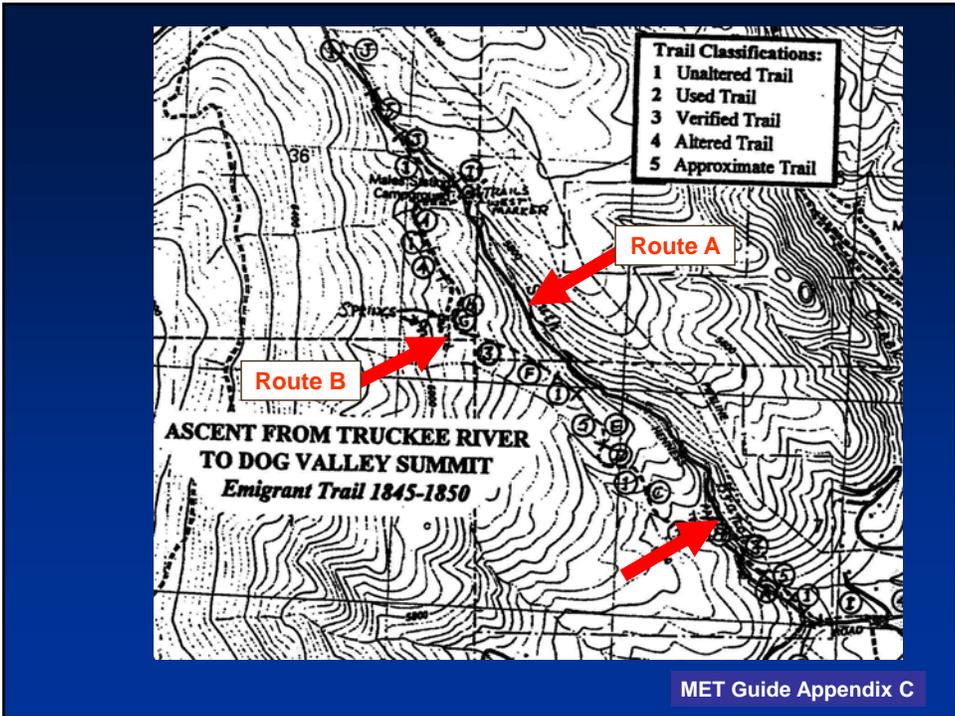
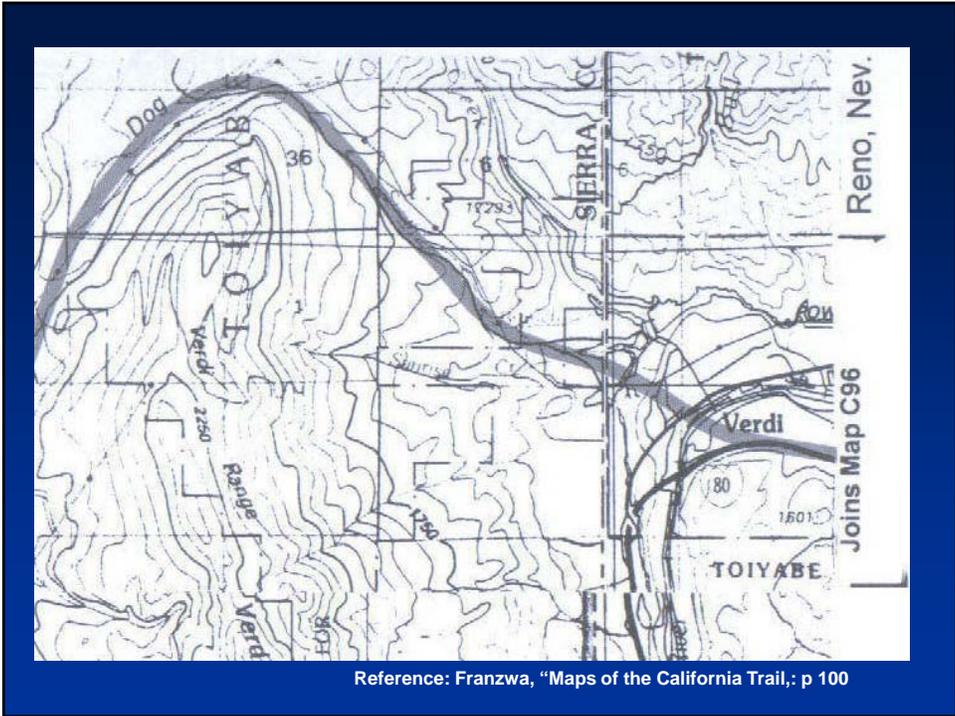
MET Guide after page 22.



Case Study:

Trails to Dog Valley

(California-Nevada State Line near Reno)





COMPOSITE TRAIL DESCRIPTION METHOD

Chronological Order of Diary Accounts of the Original Trail from the Truckee River to Dog Valley

[Material in brackets added for clarification]

Example 1 - Edwin Bryant: Aug. 24, 1846

Following the *[Truckee]* river between two and three miles farther up, we turned abruptly to the right, crossing its channel about the thirtieth time, and through a ravine or gorge ascended the range of mountains on our right. We reached the summit of the range by a comparatively easy and gradual ascent, passing over some rocky, but no difficult places. We reached the summit of the gap that afforded us a passage over the mountain, about eleven o'clock, and descended a long and very steep declivity on the other side, bringing us into a small, oval-shaped and grassy valley *[Dog Valley]*, with a faint spring branch *[Dog Creek]* of pure cold water running through it.

DJW: Nothing discriminates between the two theories



Example 2 - Heinrich Lienhard: Oct. 1, 1846

From here *[at the 27th crossing where the Truckee River turns south]* our road took us directly up the mountain, through thick forest, across a difficult, rocky, mountain slope. We were in constant fear that the wheels of our wagon would strike against the giant fir trees on the lower side of the road. After driving upward for some time without making much headway, we reached a grassy and somewhat moist valley *[Dog Valley]*, where we decided to camp.

DJW: The reference to "across a difficult slope" could indicate they left the stream bed and used Route B. On the other hand, the reference to "giant fir trees" is more consistent with the stream route (Route A).



Example 5 - Edward C. Harrow: Aug. 19, 1849

Road rough, rocky, but good. At 4 ½ [hours] we descended a small hill but commenced ascending again, which we continued till 5½ [hours], when we descended a very steep abrupt and long hill, into a small but lovely valley [Dog Valley].

DJW: Did they leave the ravine and “at 4 ½” and ascend via Route B? Map shows that the units are not hours and not miles.



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.



Example 9 - Augustus Ripley Burbank: Sept. 7, 1849

[In the morning he makes the 27th and last fording of Truckee River.] we nooned ½ mile from the ford & near a spring branch (a tributary) [*Dog Creek*], passing on we commenced ascending the mountain through a thick forest of hearty pine timber, passed over two high elevations & passed to the North of the third & highest elevation, passed a small spring rivulet on the top of the mountain, it crosses the road from the left, descending & passing through a very rocky ravine, we soon came to the mountain descent long & precipitating. we descended to the small beautiful valley [*Dog Valley*] and encamped along side of the dog spring. ... the road runs N.W. to the valley & springs, then turns short to the South. ... (The springs are 5 miles from the river).

DJW: Reference to spring points to Route B



Summary: Dog Valley Route Composite Methodology

- Coherence – linear consistency
 - Either acceptable
- Documentary Corroboration
 - Trail documents support the use of Route B, but do not exclude the use of Route A
- Collateral Evidence
 - Swales and traces found along Route B; confirmed by training class in 2005
 - Archaeology not done
 - Area has been burned and logged multiple times
- Correlation of all sources
 - Indicates possible use of both routes
 - No definitive evidence of one route over the other



Summary - Mapping

- Principles
 - Probability
 - Analogy
- Cardinal Rules
 - Coherence
 - Corroboration
 - Collateral
 - Correlation
- Guidelines and Indicators for Locating Wagon Roads
- Tools
 - GLO maps
 - USGS maps
 - Trail documents
 - Other research
 - Aerial photographs
 - GPS

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