

MAPPING EMIGRANT TRAILS MANUAL

PART C PLANNING AND EXECUTING A MAPPING PROJECT

**Prepared by the
Mapping and Marking Committee**

**Fifth Edition
(Revised and Expanded)
June 2014**

**Published by the
Oregon-California Trails Association
P.O. Box 1019
Independence, MO 64051-0519
816-252-2276
octa@indepmo.org
www.octa-trails.org**

**© Copyright 1993,1994,1996,2002, 2014
By Oregon-California Trails Association
All Rights Reserved**

(This page intentionally blank)

PART C - TABLE OF CONTENTS

PLANNING AND EXECUTING A MAPPING PROJECT.....	1
INTRODUCTION	1
DETERMINE THE NEED.....	1
SELECT A PROJECT	1
DEFINE A TRAIL CORRIDOR.....	2
DEFINE THE SCOPE OF THE PROJECT	2
1. Determine Where the Trail Starts and Ends.....	2
2. What Type of Terrain and Vegetation	2
3. Land Ownership (Public and Private)	2
SCOPING MEETING WITH CORE PLAYERS	3
RECRUITMENT OF TEAM MEMBERS FOR A MAPPING PROJECT	3
SCHEDULING OF EVENTS	3
COLLECTION AND REVIEW OF DATA.....	3
1. Diaries and Journals	3
2. Reports, Publications, Books, Letters, Emigrant Guides, Newspapers, Libraries, Museums	4
3. General Land Office Plat Maps and Surveyor Notes.....	4
4. Other Maps.....	6
5. Aerial Photos.....	6
PREPARING FOR FIELD WORK – PLAN OF ACTION	6
EQUIPMENT	6
1. Geographic Positioning System (GPS) Units	6
2. Scales and Templates	6
3. Hand Held Two Way Radios	7
4. Tools – Saws & Loppers	7
5. Metal Detectors	7
6. Survival Equipment.....	7
FIELD WORK.....	7
1. Meeting Location	7
2. Locating Trail Segments	7
3. Identifying and Analyzing Artifacts	8

4. Recording Trail Data.....	8
THE MAPPING PROCESS	10
MAPPING WITH USGS 7.5 MINUTE TOPOGRAPHIC MAPS	10
THE MAPPING PROCESS WITH TERRAIN NAVIGATOR PRO (TNP).....	10
Naming the Project	10
Transferring Data from GPS Units	10
Creating Markers	10
1. Full Name.....	10
2. Symbols.....	11
3. Position (Coordinates).....	11
4. Notes (Comments)	11
Suggested Marker Protocol Using Terrain Navigator Pro	12
Trail Location Markers	12
Artifact Marker	13
Feature Marker	14
Signage.....	15
Other Historical Signs	16
Rail Marker	17
Beginning and End of Trail Classification Marker	18
GLO Marker.....	20
Converting a Surveyor Reference to a TNP Map	21
Creating Labels	22
Legend or Titles	23
Tracks.....	23
TNP REPORTS	23
Final Map	25
Importing and Exporting Projects (Terrain Project Archive)	25

PLANNING AND EXECUTING A MAPPING PROJECT

INTRODUCTION

When planning a mapping project the trail researcher/mapper should view the task with the same methodology one would use in the most involved projects. A detailed series of steps from the conception of need to the final conclusion of trail recording using the widely accepted Mapping Emigrant Trails (MET) standards and procedures are a starting point. Beginning with the definition of the project, the trail researcher /mapper will do a preliminary survey to establish/define the scope and task at hand. The collection, review and analysis of relevant data, processing the data and arriving at the most probable trail location follows. Relevant data will be used to produce a final map done to MET standards.

DETERMINE THE NEED

Before determining the need for a mapping project, the trail researcher/mapper should review the various routes used for emigrant travel to see which trails have been mapped to MET standards. Although the National Park Service (NPS) is the primary repository of completed trail maps, they may not have all completed maps and not all the maps sent to the NPS are at MET standards. A review of the inventory from the National Park Service will indicate the numerous emigrant trails that need to be mapped to MET standards.

National Park Service Contact:

Geographic Information Systems (GIS) Coordinator
National Park Service - National Trails Intermountain Region
PO Box 728 Santa Fe, NM 87504-0728
Tel: (505) 988-6024 - Fax: (505) 986-5214

In addition to the NPS, there are other locations that maps may be stored - .i.e. OCTA headquarters, colleges and universities, state libraries, public agencies, or they may still be in the hands of the original mappers. Several OCTA chapters have inventoried emigrant trails within their location to determine which trails have been mapped. A large portion of maps however are presently not at MET standards and merely show a general route. Having an inventory spread sheet of the trails that are located within a region will assist in determining the need for a mapping project. After determining the trails that require MET standard mapping the project can be selected.

SELECT A PROJECT

Selecting a project often depends on the resources available. Some trail mapping projects may be done by an individual. Other projects may use the team approach. Regardless, selection of a mapping project, whether an entire trail or a segment of a trail, should be such that the trail mapper has an expectation of completion in a reasonable time.

DEFINE A TRAIL CORRIDOR

Once a project is selected and it is determined that a trail needs to be mapped to MET standards it's nice to know where it is on the ground. General Land Office (GLO) maps as well as other historic maps can often indicate a trail location. Other sources would include aerial photos, diaries, journals, newspaper articles, various reports such as federal, state, county, territorial, railroad and military surveys. Using the above references as sources for a preliminary map can establish the estimated route of the trail to be used in the field survey and to assist in defining the scope of the project.

DEFINE THE SCOPE OF THE PROJECT

The ultimate goal of a mapping project is to map a trail to MET standards. In order to determine what the project will entail numerous factors need to be considered. These include:

1. Determine Where the Trail Starts and Ends

What is the length of the trail that will be mapped? Should this trail mapping project be divided into segments because of its length?

2. What Type of Terrain and Vegetation

Desert, mountain, open plains. Consideration of the type of terrain will determine the effort and equipment required. Vegetation can make it difficult to navigate the route. Mountain regions are often overgrown with brush or heavily forested. Some desert sage brush also makes it difficult to navigate.

3. Land Ownership (Public and Private)

It's incumbent to obtain land owner permission in order to do a trail mapping project. First the trail mapper must determine who owns the land regardless of whether it's public land or private land. Probably the best source to determine this is the local county assessor's office. The county assessor maintains a master property list of all land owners within his/her jurisdiction. The assessor also maintains assessor plat maps and assessor parcel numbers for all of the land. The assessor's plat maps indicate land descriptions used to identify assessor's parcel numbers. The parcel number is used to determine property ownership. On public lands, whether federal, state or local, it is always advisable to be in direct communication with the agencies. Most trail mapping requires more than a casual glimpse of the land being mapped. Many land managers such as the Forest Service and Bureau of Land Management are requesting trail mappers through organizations such as OCTA to assist in determining historical significance on the lands they manage. Trail mappers often work under volunteer agreements or special use permits that grant additional flexibility to work on public land. To avoid trespass, it is always necessary to obtain prior permission to enter private land. Often a private land owner is unaware that there may be something of historical significance on their land. Many times they are eager to participate, sometimes they are not. Respect their decision.

SCOPING MEETING WITH CORE PLAYERS

During this phase those interested in the project should plan to meet with the core players such as land owners and/or agencies. If a project leader has not been selected this would be an opportune time. Whenever possible, a team concept should be encouraged. Besides utilizing special skills and interests, it fosters camaraderie and enhances the experience.

RECRUITMENT OF TEAM MEMBERS FOR A MAPPING PROJECT

Although many mapping projects are done by an individual, working collectively as a mapping team effectively utilizes the various skills of the team members. A team endeavor creates an atmosphere of camaraderie making the project more enjoyable. The various skills of team members contribute to the comprehensiveness of a mapping project. Where one team member might enjoy the research required in a project another might be expert in GPS technology.

Sources for team members include; OCTA members, historical organizations, service organizations, historians, and colleges. Community interest articles in local newspapers about historical projects may also generate interest. The enthusiasm of active trail mappers can also be a recruitment method. Join us to save the trail!

SCHEDULING OF EVENTS

Trail mapping projects should include a defined schedule of events including; planned field work published through email or websites, research events, and social time. A beginning of the year event, such as a potluck, may be a good way to start a new project or schedule the events for the upcoming year. Setting realistic goals for the year and scheduling dates for various activities, including research and field work, are important to keep the project moving forward.

COLLECTION AND REVIEW OF DATA

The more you know about an emigrant trail the more pieces to the puzzle you will have and eventually it will make a picture. In order for the trail researcher/mapper to have a successful project it is incumbent to collect, interpret and apply as much trail information as possible. Although the main focus of the project is to map an emigrant trail on the ground, before that can be done much research work is needed to provide the trail mapper with data necessary to proceed. Research includes but is not limited to archival research such as diaries, journals, letters, newspaper articles, books and publications.

1. Diaries and Journals

Emigrant diaries/journals are one of the most widely used sources for researching emigrant travel as they are a firsthand accounting of the journey. There are hundreds of emigrant diaries and journals that are invaluable in trail research.

A primary source for locating diaries on a specific trail is the Census of Overland Emigrant Diaries (COED). COED provides a key aid for trail research. The database, an index of

documents, does not include the actual documents. The National Frontier Trails Museum in Independence, Missouri houses the COED database.

Seek help from OCTA headquarters staff if necessary to contact the NFTM. Paper-Trail.org (<http://www.paper-trail.org>) is a small segment of the master database, providing names for genealogists. The OCTA website has a link to *Paper Trail*.

The COED database allows researchers to search by route, destination, jump-off location, location along the trails, landmark, and combinations of terms. Of course this means they had to be mentioned in a document. The "surveys" supplied in Paper-Trail.org are the data entry forms used to build the complete database. Reports from COED searches will give the documents' authors which can then be used to search and find the surveys using Paper-Trail. The surveys give the last known location of the document. Some of the locations are listed as "private", indicating the document owners don't want to be contacted. Searches for modern location names or for common names such as "willow creek" or "rock springs" are a waste of time. Libraries often don't know they hold documents in special collections that are not catalogued and a certain amount of persistence is required to get a copy. They need to know it was surveyed at the institution and therefore they have it.

COED searches often produce a list of documents with their respective repositories, but it is still the researcher's responsibility to get a copy of the document.

2. Reports, Publications, Books, Letters, Emigrant Guides, Newspapers, Libraries, Museums

The availability of information now online can lead the trail researcher to locations for information germane to their project. Other sources for research are:

The Mattes Library at OCTA's Headquarters in Independence, Missouri has a large selection of trail related materials. (<http://www.ci.independence.mo.us/NFTM/TrailsResearch.aspx>)

State libraries, local libraries and museums are an excellent source for reports, publications, books and other information. Reports, such as federal, state, county, territorial, military, railroad surveys and highway department, may describe the location of emigrant trails. Heritage associations, historical societies and other organizations may have trail related documents. Examples of available newspaper websites are:

Library of Congress: Chronicling America <http://chroniclingamerica.loc.gov/>

California Digital Newspaper Collection <http://cdnc.ucr.edu/cdnc>

3. General Land Office Plat Maps and Surveyor Notes

GLO plat maps are one of the earliest detailed accounts of land description using the government survey system for creating townships, ranges and sections. Along with the surveyor's notes this can be one of the greatest assets to the trail researcher/mapper. It is important to remember that

these maps were designed to establish section corners as reference points and section lines. It's incumbent upon the trail researcher/mapper to verify the accuracy of these maps. Many states make GLO plat maps and surveyor notes available online while others may be available from the BLM or other government offices. See Appendix 3.

General Land Office surveyors used a 66 foot Gunter Chain with 100 links (chain) as their standard unit of measurement when establishing points on section lines. A link is a 100th part of a chain and thus is 0.66 foot. For example if a distance from a section corner to a road or trail feature is expressed in the GLO notes as 63.47 chains then the feet would be the sum of the number of chains (63) times 66 ft./ chain and the links (47) times 0.66 ft./ link [63 x 66 = 4158 ft. plus 47 x 0.66 = 31 ft.] or 4189 feet. To convert to meters the feet are multiplied by 0.3048 meters per foot. The product being 1276.8 meters.

It is also important to distinguish between a "found" corner and a projected map corner. Using a "found" corner, indicated on the USGS Quad by a red +, the measurement can be made from a known point on the ground. A GPS reading on this corner point coupled with the field note chaining information can provide a fairly accurate field location. A projected corner from a USGS Quad is much less certain. This is particularly true if resurveys were done that found none of the original corner evidence and established new corners. When GLO plats and corresponding surveyor notes indicate emigrant trails crossing sections lines it is useful for the trail mapper to establish this location on the trail map and to create waypoints for field review.

There are scales available for converting chains to feet or meters when transferring points to modern topographical maps. If a scale isn't available you can convert the number of chains and links into feet and measure the location of the trail crossing from a known or projected reference point, generally a section corner.

Waypoint coordinates can be established by using a Universal Transverse Mercator (UTM) Grid Reader or using Terrain Navigator Pro (TNP). Other methods may include: Calculating proportional distances along the section line on the GLO plat and using the same proportion on the modern topographical map. Trail mappers need to be aware that GLO surveyors only provided accurate measurements on section lines. Plats provide only a schematic representation of internal features unless specifically called out as measurements from the section line in the notes. A transparency of a GLO map scaled to match the modern topographical map can be overlaid and points marked. Certain photo editing software allows you to adjust the GLO map scale to the current topographical map scale and add the scaled GLO as a layer so points can be matched.

Occasionally section corners may be in question due to original inaccuracy or later resurveys. Another validation of a trail location can be taken from a known feature such as a river or creek.

Using the surveyor's measurements from an established natural feature to the trail crossing on a section line may provide a more accurate location.

4. Other Maps

Other early maps can be helpful in locating trail routes. For example:

David Rumsey Map Collection: <http://www.davidrumsey.com/>

Historical Topographic Map Collection: <http://nationalmap.gov/historical/>

See Appendix 8 for other map sources.

5. Aerial Photos

Current and historic aerial photos are a useful tool for the trail mapper. Historic aerial photos may be available. Google Earth's current photos and historical imagery aerial photos are available online. Terrain Navigator Pro (TNP) also has an aerial photo component. At USGS Earth Explorer more historic aerial photos are available.

PREPARING FOR FIELD WORK – PLAN OF ACTION

Develop a systematic plan in advance to maximize your time spent in the field. Determine the location for each field outing. Remind team members of the dates, time, meeting location and any equipment or personal items they should have. Be sure you have obtained permission to enter the land. Have the necessary permits available. Prepare field maps using digital topographical maps, 7.5 min. quads, and aerial photos with pre-established waypoints from GLO maps, survey notes or other sources. Other features found in diaries, reports, and publications can also be shown on field maps.

EQUIPMENT

When preparing for field work assure availability of essential equipment. Useful equipment for the trail mapper includes:

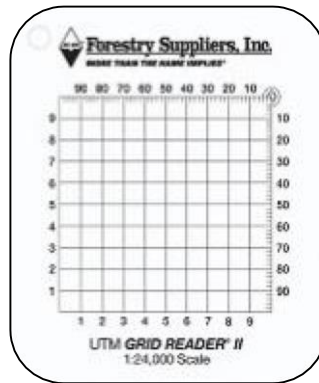
1. Geographic Positioning System (GPS) Units

Handheld GPS units available, in a multitude of price ranges, are a must for the mapper. The coordinates from the prepared field maps are either downloaded or transferred manually to the GPS unit for use in the field. Extra batteries should be carried at all times.

Prior to GPS mapping it is desirable to go to a known geographic point and verify that the GPS provides a correct location. There are a number of brass capped monuments established by the Coast and Geodetic Survey which are indicated by red triangles on TNP maps. Clicking on the red triangle brings up the details of the monument location and geographic coordinates.

2. Scales and Templates

A variety of scales and templates are available to assist the trail mapper. A few useful tools include: Multiscale Quadrangle (12 different scales in feet, miles, chains and meters), UTM Grid Reader (1:24,000), UTM Joint Plotter (Multiple Scales). These can be obtained through forestry supply outlets or drafting supply outlets.



3. Hand Held Two Way Radios

Hand held two way radios allow communication at all times in the field. It is important to know the location of team members for safety reasons as well as sharing important trail information.

4. Tools – Saws & Loppers

At times it's necessary to clear brush or debris from trail corridors. Be sure permission has been granted to remove vegetation.

5. Metal Detectors

More information pertaining to metal detecting will be found under Locating Trail Segments.

6. Survival Equipment

Trail mappers should have with them at all times an adequate supply of drinking water, food, first aid kit, insect repellent, sun screen, appropriate clothing and boots. Those with allergies to bee stings should have an EpiPen.

FIELD WORK

1. Meeting Location

A pre-established meeting location should be determined when preparing to go to the field. Once the trail mapping team arrives, take the opportunity to distribute waiver forms and materials, go over safety procedures, and discuss the day's activities. This is also the chance to discuss the do's and don'ts on the trail. If working under a special use permit or volunteer agreement issued by a public agency, mappers need to be aware of what is permitted. This includes a working knowledge of federal, state and local regulations and OCTA's policies and procedures as they relate to trail mapping. See Appendix 9, "OCTA Policies." If working on private land, permission is required from the land owner and a clear understanding of what is allowable.

2. Locating Trail Segments

By this time trail mappers should have collected, examined and analyzed relevant written and cartographic trail data. Field maps have been prepared. Pre-established waypoints have been established from various sources and now it's time for the trail mapper in the field to look for

physical and/or artifact evidence that would give rise to the probability of an emigrant trail location.

Swales, ruts, tree blazes, rust on rocks, rock cairns, vegetation anomalies or other physical features that may support an emigrant trail location are signs to look for in the field.

Although a sensitive issue, metal detecting has taken on an important role in emigrant trail validation. Many times the trail mapper will see what appears to be a trail segment when in fact it is not. As discussed in Part A of the MET manual, there are many factors to consider when looking at physical features on the ground.

Often the discovery of emigrant or wagon artifacts uncovered with metal detectors is very useful in verifying emigrant trail segments. This process may also determine that this alignment was used at a later time, perhaps for freighting or vehicle traffic. Regardless, skill is required in identifying age and use of artifacts. Artifacts that are discovered in trail locations are identified, described in detail including measurements, photographed, and a GPS reading is taken. Unless otherwise authorized by the land manager all artifacts are reburied exactly at their original location.

The use of metal detectors is highly regulated and to avoid violating federal laws the trail mapper must adhere to OCTA's policy regarding the use of metal detectors on historic trails and sites. See OCTA Archaeology Policy – Appendix 9.

3. Identifying and Analyzing Artifacts

There are numerous publications to assist the trail researcher/mapper in identifying and analyzing artifacts. See Appendix 10.

4. Recording Trail Data

When the trail mapper is in the field it is necessary to record all data that pertains to an emigrant trail. Even the most insignificant details may contribute to the final conclusion as to the location of the trail. GPS waypoints are established for:

- Trail locations
- Artifacts
- Features
- Existing signage (Carsonite markers, rail markers or other signage)
- Beginning and end of each trail classification including the classification number.
- Photo documentation (See Part E)
- GLO references
- Sites mentioned in diaries
- Anything else where a specific location is needed

Field notes and observations referenced to waypoints should be recorded on a form or in a notebook (see Appendix 11) for later entry into the mapping software. Generally, the more field notes available the greater the confidence the trail mapper will have in the final mapping product. If the trail is visible, GPS tracks can be used to establish the emigrant route. A GPS track can also be useful in retracing the mapper's path.

THE MAPPING PROCESS

The ultimate goal of the trail researcher/mapper is to determine as accurately as possible the true location of an emigrant trail and document the location on a map. For many years this process was accomplished by the use of the 7.5 minute topographic maps using the guidelines as set forth in the MET Manual. Several emigrant trails were mapped using this method. Using present day technology emigrant trail mapping is evolving. Mappers now have the availability of using GPS units and computers. Although there are several mapping software programs available, OCTA has adopted Terrain Navigator Pro (TNP) as the preferred product. The following explains the protocol and symbols that has been developed to produce emigrant trail maps with the use of TNP.

MAPPING WITH USGS 7.5 MINUTE TOPOGRAPHIC MAPS

Prior to the advent of electronic mapping most trail mappers utilized USGS 7.5 minute topographic maps for recording emigrant trails. Many of these maps are currently on file with the National Park Service or other repositories. The original MET Manual provided specific instructions for mapping on USGS 7.5 minute topographic maps. Some trail mappers may still be using this method. See Appendix 5.

THE MAPPING PROCESS WITH TERRAIN NAVIGATOR PRO (TNP)

See Appendix 13 for an explanation of the Terrain Navigator Pro tool bar.

Naming the Project

Each trail should be identified in Terrain Navigator Pro as a separate project. For example: Johnson's Cutoff, Grizzly Flat Trail or Old Spanish Trail.

Transferring Data from GPS Units

Waypoints can be downloaded from the GPS into TNP or manually entered. Downloaded waypoints will need to be edited to conform to the established protocol. Tracks may be downloaded from the GPS to TNP.

Creating Markers

Downloaded waypoints from the GPS unit will become markers in TNP. Markers can also be created manually in TNP. Markers have four distinct properties: 1) full name, 2) symbol, 3) position (coordinates), 4) notes (comments). **All letters should be capitalized. There should be no spaces, only hyphens, between characters in the full name.**

1. Full Name

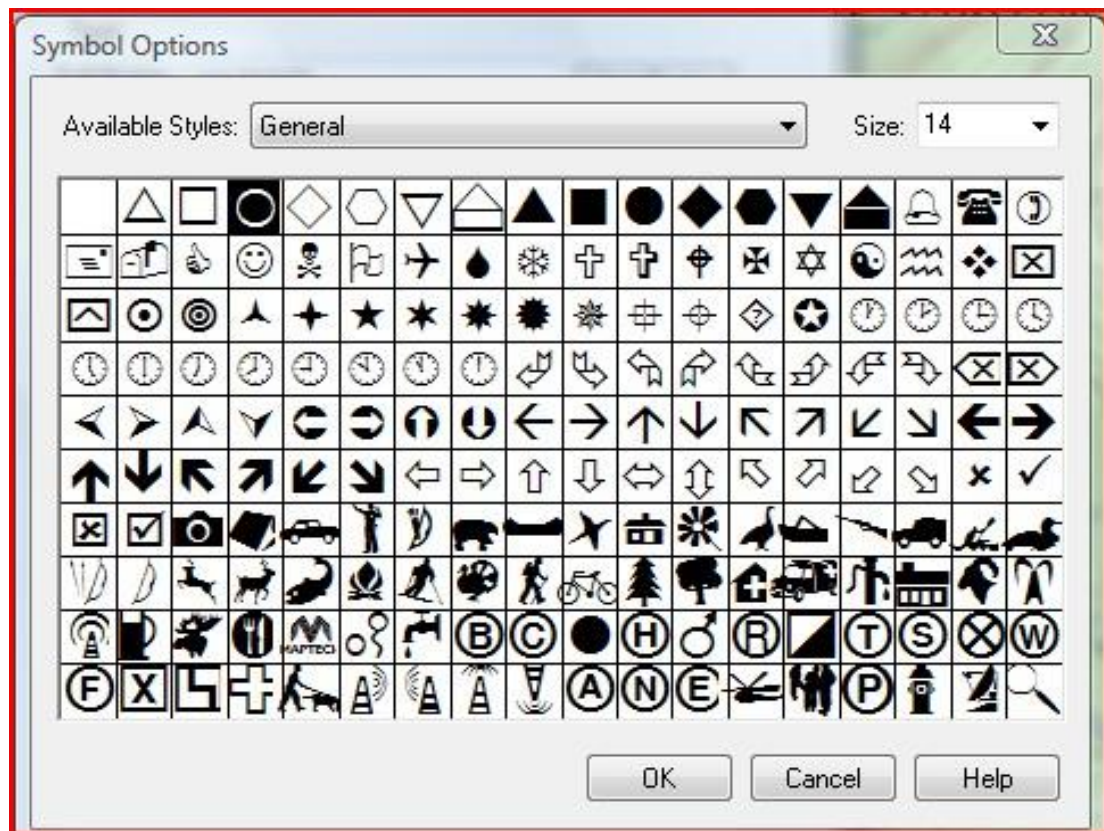
The name includes the township (three digits and direction), range, (three digits and direction), section number, waypoint number from GPS/field notes, symbol, and recorder's initials.

Example: 009N015E-12-432A-LJ

Township: 009N, Range: 015E, Section: 12, Waypoint Number: 432, Artifact Symbol: "A", Recorder's initials: LJ – Lloyd Johnson. Full names will generally not be displayed on final maps unless indicated.

2. Symbols

Symbols for the markers are from the TNP symbol library.



3. Position (Coordinates)

Most trail mappers are using the Universal Transverse Mercator (UTM). In using UTM is it important that the datum is consistent between the GPS recording and the TNP map.


4. Notes (Comments)

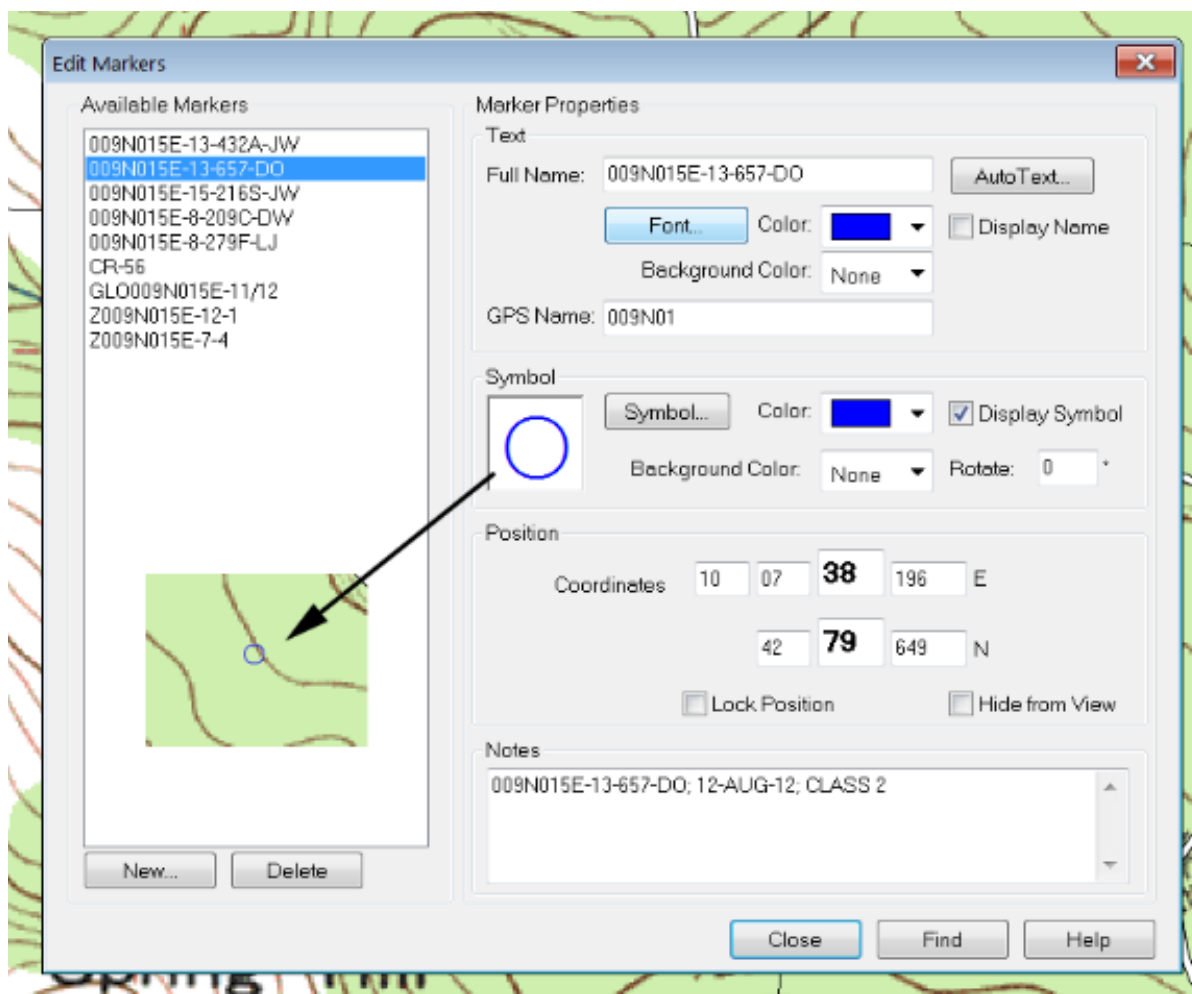
Notes include the full marker name, the field date, and description. Since the full name will not be displayed in the final map it will not be included in the electronic report. However, all the information in the note section will be displayed. Therefore the trail mapper needs to copy the full name from the full name property and paste the full name into the note section. Notes will appear as comments in the TNP electronic report.

Suggested Marker Protocol Using Terrain Navigator Pro

Trail Location Markers

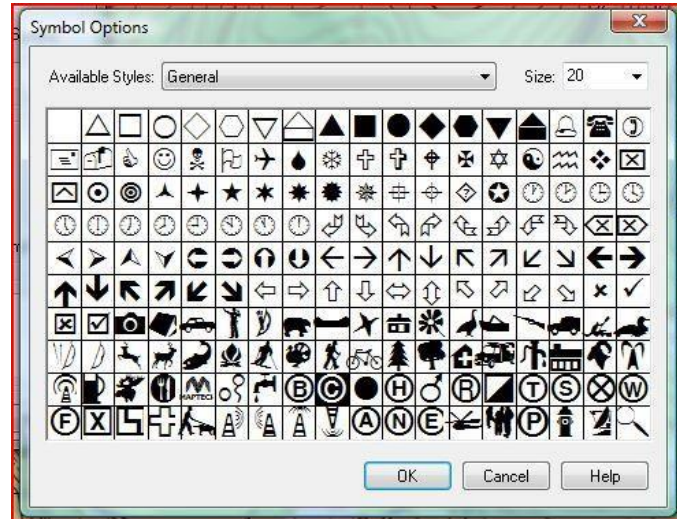
Trail location markers are field waypoints that the trail mapper has determined to be the location of the emigrant trail. These waypoints create the trail route.


1. Name: Arial, size 12, regular, blue (default); Township Range-Section-Waypoint Number-Initials of Recorder; example: 009N015E-13-657-DO
2. Symbol: Circle, blue, size 14, 
3. Position: UTM coordinates
4. Notes (Comment): Full Name (copy and paste from full name to notes), date, trail classification.

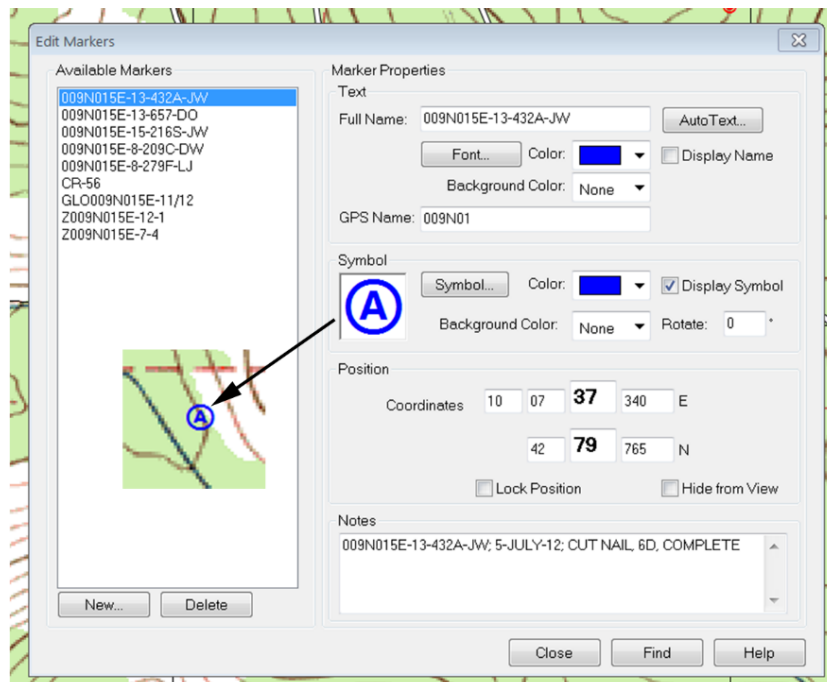


Artifact Marker

When an artifact is found a waypoint is created at the place of discovery. When creating the TNP map the waypoint becomes the Artifact Marker. The symbol “A” is used to identify the marker as an artifact. An “A” is placed in the full name after the waypoint number.




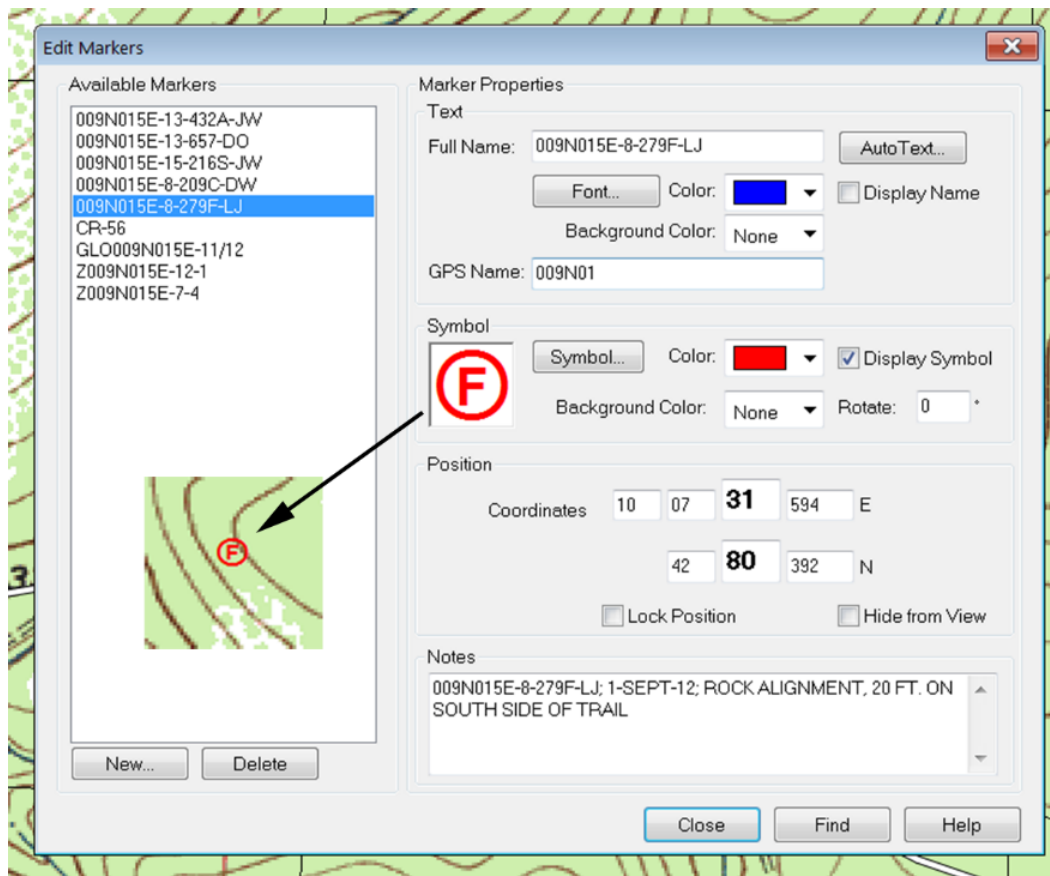
1. Name: Arial, size 12, regular, blue (default); TownshipRange-Section-Waypoint NumberA-Initials of Recorder; example – 009N015E-13-432A-JW
2. Symbol: Circle with A, blue, size 14, 
3. Position: UTM coordinates
4. Notes: Full Name (copy and paste), date, description of artifact



Feature Marker

Features are attributes that pertain to the trail such as: swales, ruts, rust on rocks, location descriptions from diaries, tree blazes, rock cairns, important watering source, camping areas, emigrant inscriptions, vegetation anomalies or other physical features that support an emigrant trail location. An “F” is placed in the full name after the waypoint number.

1. Name: Arial, size 12, regular, blue (default); TownshipRange-Section-Waypoint NumberF-Initials of Recorder; example – 009N015E-08-279F-LJ
2. Symbol: Circle with F, red, size 14, 
3. Position: UTM Coordinates
4. Notes: Full Name (copy and paste), date, description of feature




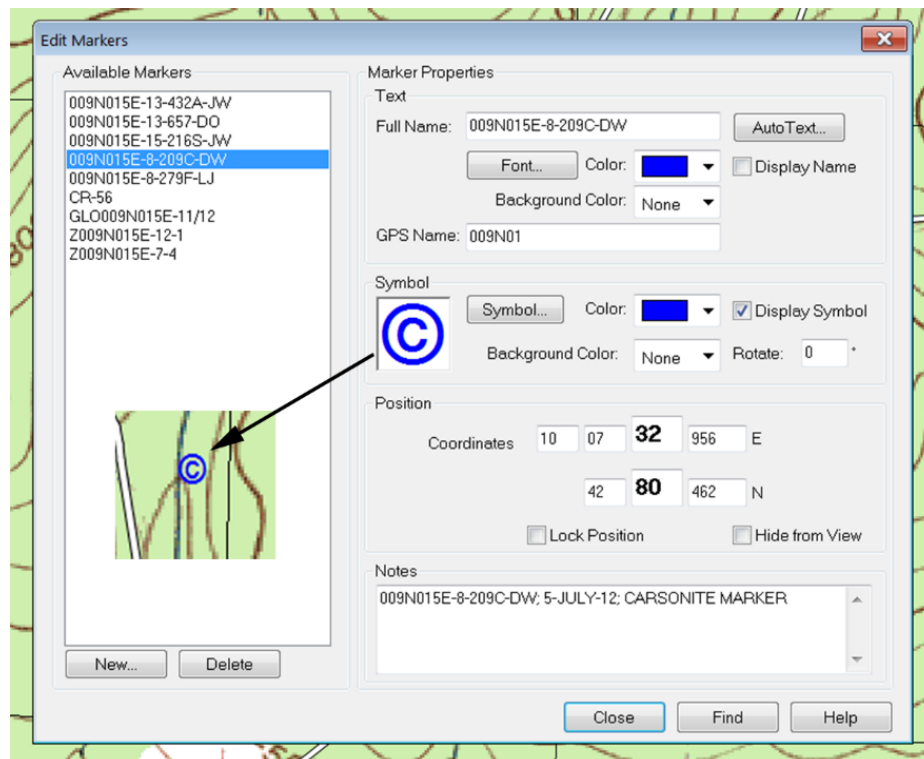
Signage

Carsonite Markers and National Historic Trail Triangles Forest Service and Bureau of Land Management Markers




Carsonite markers and National Historic Trail Triangles are the signature marking devices of OCTA. Whenever locating or identifying the location of an existing Carsonite or National Historic Trail Triangle a unique marker identification is created. A “C” is placed in the full name after the waypoint number. In some states the Forest Service and Bureau of Land Management have used wood sign posts and concrete posts to mark historic trails. These markers would also be identified and located using the same recording method as Carsonite markers and National Historic Trail Triangles.

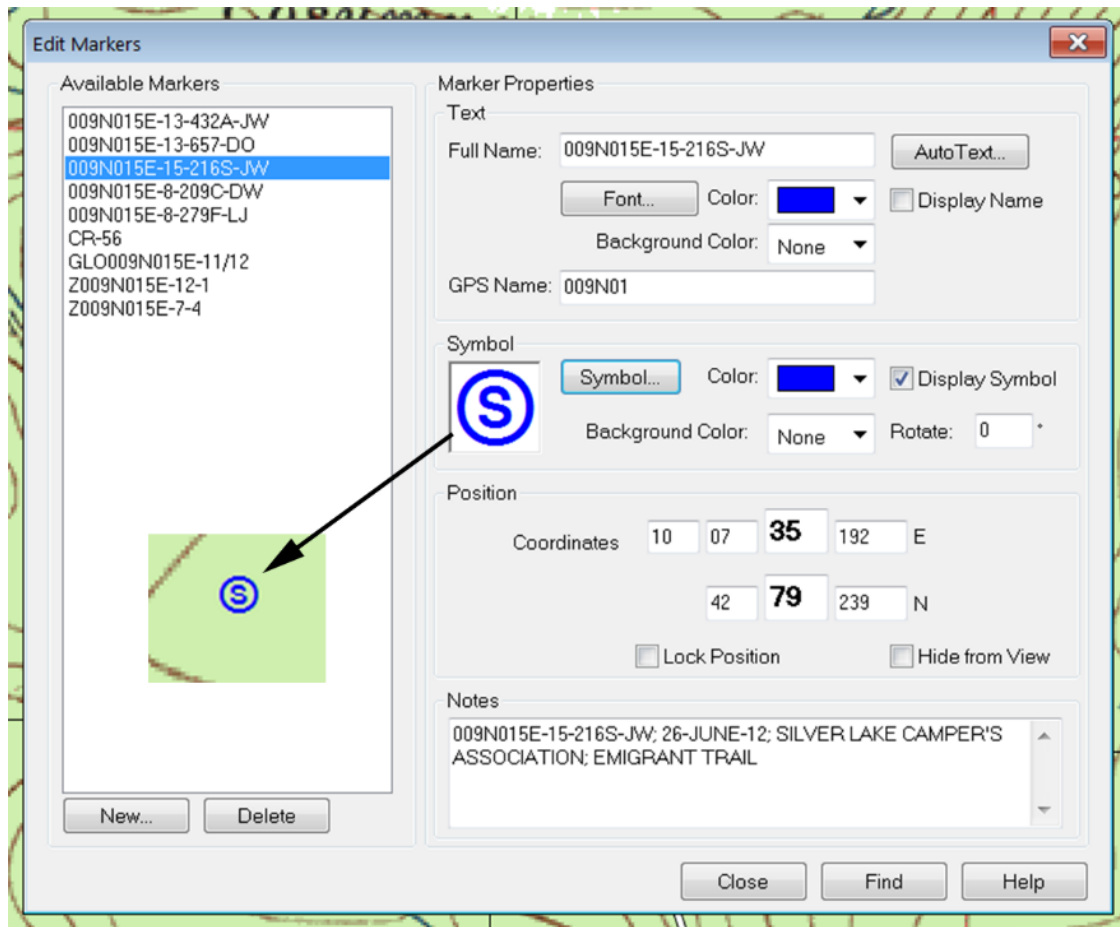
1. Name: Arial, size 12, regular, blue (default); TownshipRange-Section-Waypoint NumberC-Initials of Recorder; example – 009N015E-08-209C-DW
2. Symbol: Circle with C, blue, size 20, 
3. Position: UTM Coordinates
4. Notes: Full Name (copy and paste), date, Carsonite or National Historic Trail Triangle



Other Historical Signs

Other historical signs placed by a variety of sources may be located on emigrant trails. The trail mapper may wish to record this historical reference and show it on the map. An “S” is placed in the full name after the waypoint number.

1. Name: Arial, size 12, regular, blue (default); TownshipRange-Section-Waypoint NumberS- Initials of Recorder; example –009N015E-15-216S-JW
2. Symbol: Circle with S, blue, size 20, S, 
3. Position: UTM Coordinates
4. Notes: Full Name (copy and paste); date; type of sign or what it says



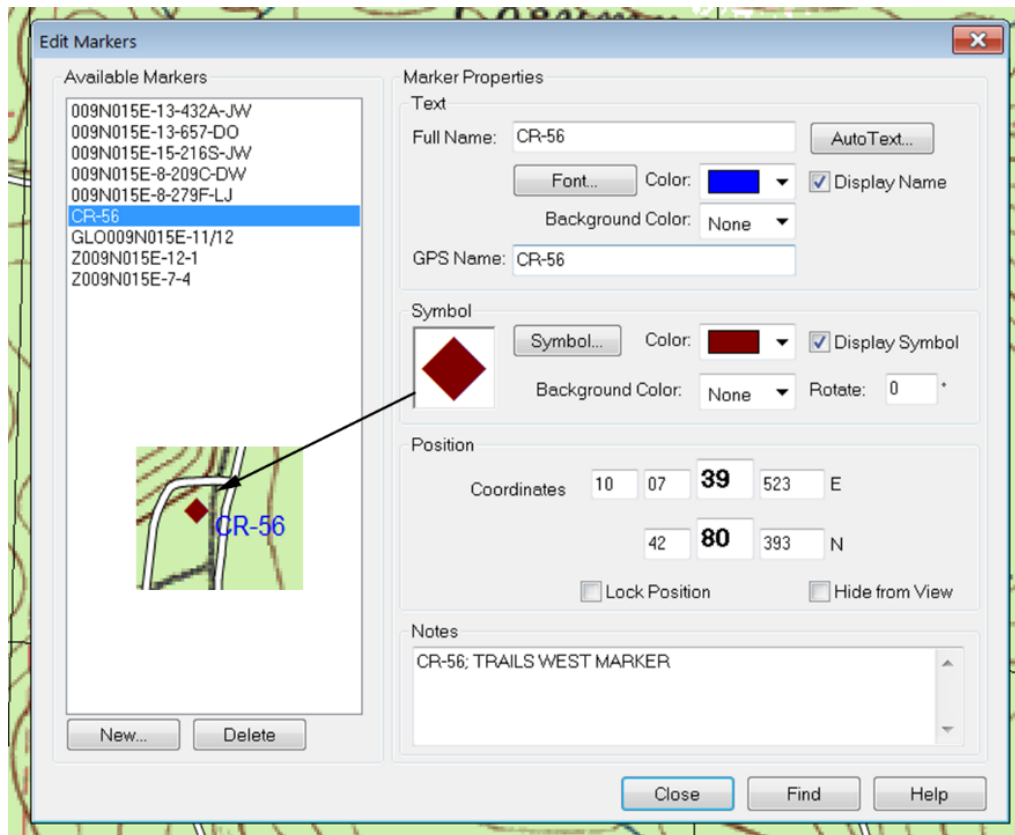
Rail Marker

Trails West Inc., a nonprofit group of emigrant trail enthusiasts, has placed over 600 rail markers in the Western United States, mostly Nevada and California. These rail markers are located either on a known emigrant trail or in close proximity. It is suggested that this form of trail signage be included on the map.

1. Name: Arial, Bold, Blue, size 12; Trails West Name, example - CR-56 (Carson Trail – Marker 56),
Name – Displayed




2. Symbol: Diamond, maroon, size 20,
3. Position: UTM Coordinates
4. Notes: Full Name (copy and paste); CR-56, Trails West Rail Marker



Beginning and End of Trail Classification Marker


The ultimate goal of creating an emigrant trail map using MET standards is to identify and show the trail on the map using the established MET trail classification system. This describes the current condition and appearance of the trail. See Part A.

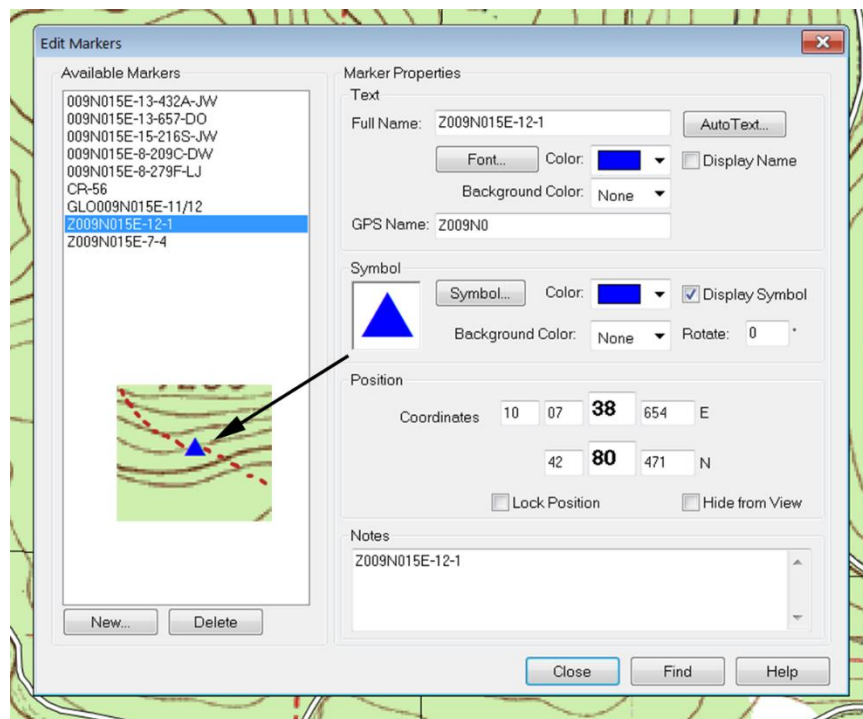
While in the field the trail mapper attempts to numerically classify each trail segment. A waypoint indicating the class is established at the beginning of a trail segment. Another waypoint is established at the end of that trail segment designating the beginning of a different trail classification. Trail classification waypoints are established in the direction of emigrant travel, typically east to west.

Markers are created from the established waypoints using the delta,  (solid triangle)


The numeric trail classification is shown next to the trail segment using the TNP label. See Labels.


To distinguish trail classification markers from other markers the full name begins with a Z. This also separately identifies trail classification markers in the TNP list of available markers for the open project. The full name continues with Township, Range, Section and trail classification. The trail classification number corresponds to direction of travel, typically east to west.

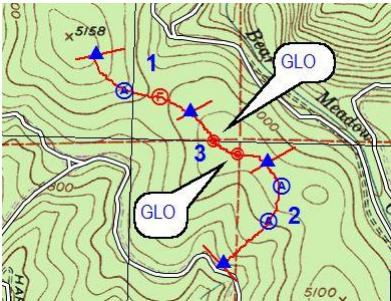
1. Name: Arial, size 12, regular, blue (default); ZTownshipRange-Section-Class (direction of travel); example - Z009N015E-12-1.
2. Symbol: Solid delta (triangle), blue, size 20, 
3. Position: UTM Coordinates.
4. Notes: Full Name (copy and paste) - Z009N015E-12-1; Other comments



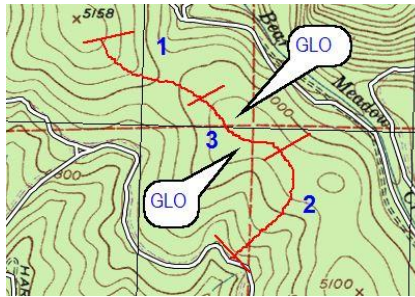
The significance of a trail marker for the beginning and end of a trail class is important to the trail mapper and the trail mapping process. The marker's full name, symbol, position (coordinates) and notes, provide specific information regarding the trail class and location. At times, it may be desired to produce a trail map without markers that may include sensitive data, such as specific locations of artifacts, features or any other trail identifiers that may be considered sensitive.

This may be accomplished by placing a track line through the Beginning and End Classification Marker using the distance tool . Using the distance tool, draw a line through the Trail Classification Marker (delta- solid blue triangle) across the trail, extending it slightly on both sides of the marker. Convert the line to a track.

The Layer Size/Visibility tool  gives you the option of what to display on the map. By eliminating markers and displaying tracks and labels, the map will now display trail location, trail classification and trail classification segments without sensitive marker location.



Sensitive Information Shown



Sensitive Information Hidden

GLO Marker

Validated General Land Office (GLO) Plats are a primary source for trail identification. GLO surveyor notes reference an emigrant trail location. This reference should appear on the trail map.

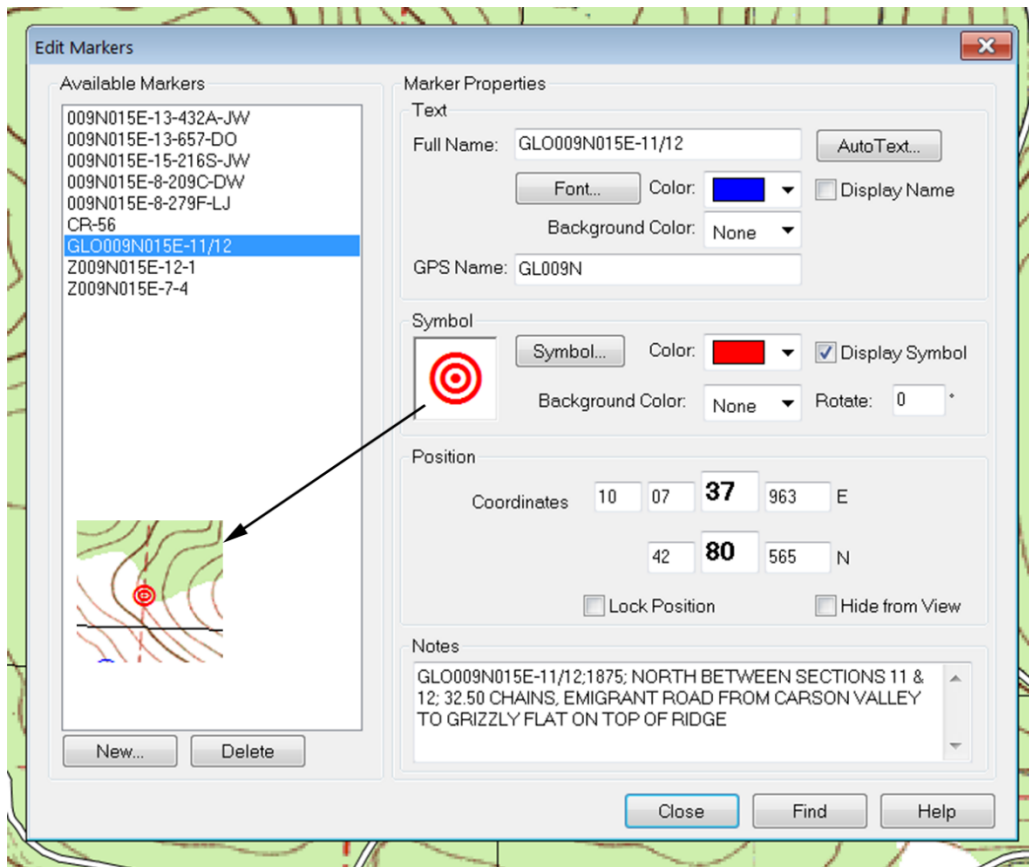
1. Name: Arial, size 12, regular, blue (default); GLO-TownshipRange-Section/Section(on line between sections) example – GLO009N015E-11/12*

*An exception would be when the section line is on a Township or Range line (i.e. – 1/6). The TNP full name would be from the surveyor notes based on the Township and Range where the reference is made.

2. Symbol: Bulls Eye, red, size 20, 

3. Position: UTM Coordinates

4. Notes: Full name (copy and paste), Date surveyed, Direction of Travel, Surveyor note including chains and links. (Links are expressed as decimal parts of a chain.)



Converting a Surveyor Reference to a TNP Map

Convert Chains to Meters

1 chain = 66 feet -


1. Multiply the number of chains x 66 to get the number of feet. - Chains to Feet
2. To convert to meters the feet are multiplied by .3048. – Feet to Meters

Locating it on the Map

If the surveyor notes indicate the reference is so many chains north of a known section corner, using the marker tool create a marker at the section corner reference by locating the top point of the triangle on the section corner. Add the number of meters calculated above to the northing coordinate. Change the northing coordinates for the marker in TNP. The marker will automatically be located at the GLO location.

Be sure to follow the direction referenced in the surveyor notes. (Example: North on a line between section 1 & 2 or east on a line between sections 4 & 9)

Creating Labels


The label tool from TNP  is used to display on the map GLO references, trail classification numbers, and other references the trail mapper wishes to place on the map. The trail mapper should exercise caution in the overuse of labels as it may clutter the map.

GLO Reference – Use in addition to marker

1. Text: Arial, regular, size 12, blue;– Name : GLO
2. Label Style: With Arrow (pointer)
3. Background color – white



Trail Classification Number

Use the label tool to place the trail classification number next to the trail track (dashed red line) between the beginning and end of the trail classification markers (solid blue deltas). 

1. Text: Arial, bold, size 14, blue



2. Label Style – none

Legend or Titles

- 1.) Text: Font, Size, Color – As Needed
- 2.) Label Style: Rectangle

Tracks

- 1.) Download from GPS unit
- 2.) Draw manually - (Style- Dashed, red,) Create short segments – perhaps trail class length

The track tool is used to identify the trail location on a TNP map (dashed red line). The two methods to create tracks are to download from a GPS unit or to manually draw using the track tool or distance tool (must be converted to a track with a right mouse click).

When downloading tracks from a GPS unit as the trail route the mapper needs to be aware that the GPS records wherever you have walked. Therefore the mapper must be certain to only record when actually walking on the trail. The track that follows the trail in the GPS unit will have a default name or it can be renamed. The field notes should include the track name and trail class.

TNP REPORTS

Terrain Navigator Pro allows you to create a written report from the marker layer using UTM coordinates. The written report would include:

Marker Layer:

1. The full name. By not displaying the full name, only the abbreviated GPS name will appear on the report therefore it is important to copy and paste the full name into the notes (comments) section as it will then appear on the written report.
2. Coordinates: UTM
3. Whatever information included in the note section of the marker will appear in the comment section of the written report.

You cannot easily preview the report. Using Microsoft XPS Document Writer or Adobe Acrobat Professional in the printer choice when printing the report will allow preview. Otherwise you must print it to see what it looks like.

Steps to follow to print a report with UTM coordinates:

Click on: File (top left toolbar)

Print (a new window will appear)

Pages (tab)

Check: Include Layer Information Page(s) box

Choose: Select Layers –

Eliminate all the layers except for markers and perhaps labels.

Click: Print

TNP reports will only include the data for the markers on the displayed map. To create reports for the entire trail you will need to print multiple reports. Use the UTM coordinates to edge match the maps.

Example TNP Report

Layer Information

Coordinate Format: UTM Datum: North American 1927

Markers

Name: <No Name>
Short Name: 009N01
Coordinates: 10 0737075 E, 4280278 N
Comment: 009N015E-13-432A-JW; 5-JULY-12; CUT NAIL, 6D, COMPLETE

Name: <No Name>
Short Name: 009N01
Coordinates: 10 0737132 E, 4279897 N
Comment: 009N015E-13-657-DO; 12-AUG-12; CLASS 2

Name: <No Name>
Short Name: 009N01
Coordinates: 10 0736709 E, 4280512 N
Comment: 009N015E-8-209C-DW; 5-JULY-12; CARSONITE MARKER

Name: <No Name>
Short Name: Z009N0
Coordinates: 10 0737102 E, 4279628 N
Comment: Z009N015E-12-1

Name: <No Name>
Short Name: GL009N
Coordinates: 10 0737219 E, 4280068 N
Comment: GLO09N015E-11/12;1875; NORTH BETWEEN SECTIONS 11 & 12; 32.50 CHAINS, EMIGRANT ROAD FROM CARSON VALLEY TO GRIZZLY FLAT ON TOP OF RIDGE

Name: <No Name>
Short Name: 009N01
Coordinates: 10 0737168 E, 4279469 N
Comment: 009N015E-15-216S-JW; 26-JUNE-12; SILVER LAKE CAMPER'S ASSOCIATION; EMIGRANT TRAIL

Name: <No Name>
Short Name: Z009N0
Coordinates: 10 0736966 E, 4280336 N
Comment: Z009N015E-7-4

Name: CR-56
Short Name: CR-56
Coordinates: 10 0739506 E, 4280190 N
Comment: CR-56; TRAILS WEST MARKER

Final Map

At this point the mapper has created an extensive database which can be printed in its entirety or by selected layers. Included in the database are trail location, trail classification, reference labels, and markers.

The purpose of the map being produced will determine the selection of information to appear on the final map. At this point the sensitivity of confidential data must be taken into consideration on what should be shown on a final map. Also, caution should be exercised as too much displayed data will affect its readability.

By producing a map with only the tracks and labels layers, the map will only display the location of the trail and trail classifications.

Importing and Exporting Projects (Terrain Project Archive)

Terrain Navigator Pro allows projects to be shared with other TNP users. Collaboration among trail mappers is important. Where multiple mappers are working on a trail all current data can be available to each mapper. Imported data can be downloaded into GPS units for trail review in the field.

Projects may be exported from Terrain Navigator Pro and saved in a single Terrain Project Archive file (.TPA). Likewise projects can be imported as a .TPA file.

To export a project:

1. Create a “My Terrain Projects” folder on your computer.
2. Open the project you want to export.
3. Open the File menu and choose Export - Active Project (bottom choice).
4. Save the .tpa file to the TNP Import Export folder you created.

A Terrain Project Archive (.TPA) file can be sent as an attachment in an email to another TNP user. Note that the entire data file will be included.

To import a project:

1. Open Terrain Navigator
2. Open the File menu and choose Import – Terrain Project Archive (bottom choice).
3. Find the folder the project (.TPA file) was saved to.
4. You will be given the option to rename the project. If a project with the same name is in your “My Terrain Projects” folder, you must rename it. The “My Terrain Projects” folder is in the Documents folder.
5. This project will then be included in the “My Projects/Manage Projects” list.