Estimating your Travel Time and Pace

These two techniques will help you in both the planning and execution of your route. Travel time is a tool that allows you to estimate how long it will take you to travel a designated distance over a certain terrain. Pacing is how to estimate the distance you are traveling along a path.

TRAVEL TIME:
Pre trip Planning:

- Estimate your Travel Time:
  - Two miles (3.2 kilometers) of on-trail travel on flat ground (carrying a medium load) = 1 hour
  - One mile (1.6 kilometers) of off-trail travel on flat ground (carrying a medium load) = 1 hour
  - For each 1000 feet (304 meters) of rise add 30 minutes.
  - Personal Travel Factor: Use your judgment concerning your personal strengths and weaknesses to either add to or subtract from the calculated time.
  - Group and load will slow you down significantly.

Example:

You want to hike Pikes Peak (14,110') from your base camp of 11,000'. You need to summit by 12 noon and the hike is 4 miles long. Using mileage alone it will take two hours but add in the 3,110' elevation gain for an additional 1.5 hours, totaling 3.5 hours. This means that without using your personal travel factor you need to leave your basecamp at 8:30am. Since this hike is at high altitude you decide to add an hour and therefore leave camp at a leisurely 7:30am.

Let's use this same example but with a different Personal Travel Factor that incorporates a group of five hikers. Safe group travel occurs at the slowest person's pace in addition to the extra time it takes for group breaks and logistics. Therefore, the leader may add in a Personal Travel Factor of one additional hour which means that the group will need to leave basecamp at 6:30am.

PACING:
Basically, this is the practice of calculating the distance traveled by counting the number of paces you have walked from Point A to Point B; you then multiply the number of paces by the known distance of your step.

A pace is the distance you cover every time your left (or right) foot strikes the ground, therefore 2 steps = 1 pace. This technique of Pacing is a fairly accurate method in determining distances in the field, but you must keep in mind that the distance of your step or pace can vary for reasons such as; terrain, load and physical condition. Although this method is a good estimate of distance it will not be precise.

Effects of Terrain: The type of terrain that you are traveling on can affect the distance of your individual paces. Whether it is steep or rugged terrain, muddy or rocky will lengthen or

shorten your step. Usually going up shortens your pace and going downhill lengthens it. Heavy vegetation and undergrowth or deep snow, will shorten your step.

Effects of Physical Condition: What your physical condition is at the time will affect the distance of your pace. Obviously if you are sick or injured, your steps can be shortened.

Effects of Load: If you are carrying large loads, such as a heavy pack your pace will be shortened.

DETERMINING YOUR INDIVIDUAL PACE:

Determining your individual pace distance is easy. First measure out a course on the ground of a known distance such as 100 meters or 300 feet, place a marker at the starting point and another one at the ending point. A school track works well. Start moving by advancing your right (or left) foot and walk the course distance, keeping track of how many times your left (or right) foot strikes the ground between the two starting and end points. Do this three or four time. It is important that you do not count every step, just count the number of times the one particular foot strikes the ground.

The WSU indoor Swenson Gymnasium track is 200 meters long. The Wildcat Stadium track is 400 meters long. 200 meters = 656'; 5,280' = 1 mile; 2,640' = ½ mile; 1,320' = ¼ mile.

Average the number of paces (not steps) it took you to walk the course and divide the distance (between the start and end points) by the average number of paces. The answer is your pace distance.

Example:

You have set up a 300 foot course to determine your pace. You have walked the course 4 times listed as follows:

1. 61 paces
2. 62 paces
3. 61 paces
4. 59 paces

Which averages out to be 243/4 = 60.75 paces, we will round up to 61. Take your course distance of 300 feet divided by 61 paces which = 4.9' or a 5 foot pace step.

These courses can be setup in different terrains to see the effect on pace distances. I would recommend that you know your pace distance in metric measure as well, because UTM grids are based on the metric system and we will be using them a good deal in the course.

To convert our pace distance to metric take the number of feet and multiply it by 0.3048. Using the example above one can convert a 5-foot pace to metric: 5 x 0.3048 = 1.5 meters.

Examples of Using Pacing:

Example A.

You have determined from your map that you need to travel ½ mile to a small spring. Since you are in dense vegetation you are concerned you might miss it. In order to assist your

time management and navigation you decide to use pacing as a catching feature. How many pace steps must you take to cover this ½ mile?
Answer: ½ mile = 2640 feet, divided by our pace distance of 5-feet = 528 tally steps. OR ½ mile = 0.8 kilometers = 800 meters, divided by our pace distance of 1.5 meters = 533 paces.

Example B.
You have traveled 343 paces on a bearing of 120 degrees, from the location of an injured party, and are now at a known trail junction. In order to better mark the exact position of this injured person how many feet is this person from this junction?
Answer: 343 pace steps times 5-foot pace = 1715 feet.

KEEPING TRACK OF THE DISTANCE TRAVELED:
In order to accurately use pacing in land navigation you must find some way to keep track of pace steps. If you become distracted at some point during travel you can easily refer to this "memory keeper" to recall the distance.

Examples: Beads on a string, pebbles in your pocket, knots in a cord, clicker or a written record are just a few of the ways that are used to enhance your memory.

Relating Field Pacing to Map Distances:
You should be aware of the error regarding map distances versus actual travel distances on the ground. This error comes from the fact that measuring map distances assumes the terrain you are traveling is perfectly flat. Unless the terrain that you are in is totally flat map distances will vary from actual walked distance because no correction has been made for uphill or downhill distances. So in hilly terrain a walking distance calculated from a map distance of five miles could actually be six miles. You will complete a trail profile during the Map Interpretation homework assignment that will help illustrate this point.

Additional Methods for Estimating Distance Traveled:
There are other methods of calculating distances but I have found only three of worth: Terrain Association, Time Traveled and GPS.

Terrain Association requires that you have a map in hand and periodic calculations of distances as you go. You relate the features you see in the field to the map and then calculate distance traveled. This is perhaps the best and most accurate method although not always practical. Not only does this method give you distances but it also gives you location and forces you to constantly interpret your natural surroundings with those on the map.

Time Traveled method involves determining the time you have been traveling and at what speed. This method is more carefree but can take some experience to know your unique Personal Travel Factor as mentioned in the Travel Time section above.

GPS can be a highly accurate but cost prohibitive method depending on your budget. With a GPS you can not only determine your distance traveled from one point to your current location but many units can also determine your average speed. This can be helpful in determining your potential arrival time.

Pacing Assignment:

Name: _____ Date: _____

Find an appropriate place to measure your pace. Determining your pace (you may use feet or meters, please specify):

1. Location at which you measured your pace: _____
    a. Distance of location used: _____
2. Number of pace steps: (1)_____ (2)_____ (3)_____
    a. Average number of pace steps: _____
3. Your Pace distance in feet: _____ (round this # to an easy to use # = _____)
4. Your Pace distance in meters: _____(round this # to an easy to use # = _____)

Using your pace distance as calculated above:

1. You have just walked 55 paces, what is the distance you have traveled: _____
2. You are planning to hide a geocache approximately ¼ mile from a trail intersection at a bearing of 220°. How many pace steps from the trail intersection do you need to walk in order to hide the geocache? _____
3. Find a steep trail or road in your neighborhood and walk a set distance (at least 100 paces) between two points. Record the number of paces between these two points for uphill and downhill travel.
    a. Uphill number of paces: _____
    b. Downhill number of paces: _____
    c. What do you think would happen to the number of paces if you added a weighted pack?
4. The group you are leading just walked 100 paces over a steep uphill and rough terrain. If your goal was 100 times your pace distance are you short, long, or at your goal? _____
5. UTM grid coordinates are 1 kilometer by 1 kilometer and consist of 100 boxes. Each box represents a space of 100 meters by 100 meters (see page 112 in Wilderness Navigation). You need to travel the distance of two UTM boxes. How many pace steps must you take to travel this distance? _____

Estimating Travel Time:

1. You are planning on hiking to Dollar Lake in the High Uintahs for a weekend backpack trip. From the trailhead to the lake is 7.5 miles, plus there is 2,000' of elevation gain. How long will it take you to make this hike (w/o personal travel factor)? _____