



Planning Routes In The Field - Part II by Athena Holtey

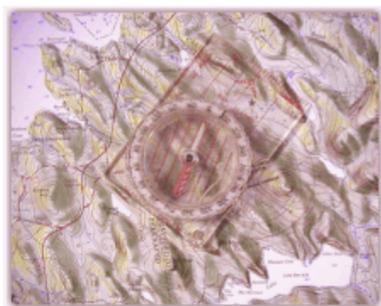
On Shore:

Determine a straight leg - Now your chart is marked with a number of planned and possible routes that you are likely to take during your journeys. This is very well and good if all works out as planned, but most trips have an unplanned event or side trip. You will need to make navigational plans, on the fly, out in the field, so here is what you can do.

If you are on shore, planning a course, you can use your pocket compass that has an azimuth ring and strait edge. Place your chart on flat ground. (Or a picnic table or something, not a car.) Determine a strait leg of your proposed route and align the straight edge of your compass along that route.

Align azimuth ring - Draw a line if possible. Keep compass firmly in place. Adjust the azimuth ring of your compass to align the pointer with the needle. Hold the map very still and do not let it slip or rotate on the surface you have placed it on.

Place your compass directly on the compass rose of your chart so that the straight edge passes through the center of the rose and the middle ring (magnetic) and rotate the entire compass so that the needle and the pointer are aligned again.



Place straight edge on center of rose; align azimuth ring - Draw a line through the rose if possible. You now have two Parallel lines, drawn or imaginary, with almost the same accuracy as the Parallel rulers.

Now determine your compass course by reading the number closest to the line, and in the direction of travel, that you have created on the rose. Jot it down or memorize your bearing.

At Sea:

You may need to "chart a course" while aboard your kayak. In the rolling cockpit of your boat it will be hard to handle and manipulate anything but a chart. You can still plot your course roughly. Use your hand and fingers as a strait edge along your intended route. Eyeball that line and transfer to the compass rose with your hand/strait edge. Some may use a small plastic protractor and maybe a grease pencil on a waterproof chart case. Using only your hand and chart will be the simplest way.

You simply have to guess on the accuracy of your eye's ability to see two imaginary parallel lines. Take note of the bearing on the magnetic ring of the rose. Now you have an approximate compass course to follow.

MEASURING DISTANCES

Measuring distances and your rate of travel will allow you to determine more precisely where you are on the line made on your chart. To do this you will have to do some experimentation. You will need a wristwatch, and two points with a known distance between. This is something you will have to work on for a while to get a feel for it before you can rely on it in the field.



Use your map or chart to determine a distance, maybe between two islands, "point A" to "point B" that you have measured to be 1 mile apart for example. Paddle at your regular rate, noting the time you started at "point A", and the time when you get to "point B".

Now you can figure your speed. If it took you 15 minutes to go one mile then you are paddling at 4 miles per hour, pretty good for a kayak. You can use Knots as a measurement of speed, but most of us think in terms of miles per hour. (One Knot = 1.15 MPH.)

Try this several times in a combination of currents and winds from different directions and different strengths. Also use a couple different routes and distances between points. You will now be able to estimate your rate of speed in a variety of conditions based on your test paddling using this method. Simply take note of your starting time.

As you paddle your route estimate your rate of speed based on your previous experiments and any observations of distances along the way. You may figure that you are going 3 MPH, possibly into a light breeze or current. Then when you need to know where you are on the route, that line you have drawn on your map, a mile and a half crossing of open water, for example, you look at your watch and see you have been paddling for 20 minutes. You determine that you have gone a mile and are now two-thirds the way to the other side.

TRIANGULATION

If you are not sure of where you are on the map during a days paddle you can use your compass to help you figure out where you are. Hopefully you have some kind of idea of where you are and what landmarks are in sight. A sharp grease pencil, protractor and a chart in a waterproof map case will greatly help.

Find a landmark that you are certain of, maybe a lighthouse. Point your kayak at it, or compass, and take a bearing. Draw a line on your map starting at the landmark and going in the direction of your estimated location. Use your compass rose or protractor to create this line with the back bearing, opposite of your compass reading.

For example if the bearing to the lighthouse is 45 degrees (North East) then the back bearing will be 225 degrees (South West). Your line on the map should represent this.



Now you know that you are on this line, somewhere. If you are lucky you may be close to a feature that will help you pin point your location, like a shoreline or island. If the line you have made crosses only one island in many then it is likely you are on or near that island. If it crosses two islands then you are still not sure where you are. This is called triangulation after all.

Take a second bearing, maybe a prominent point of land with a location you are sure of on the map. Follow the same directions to make a second line. Your position should be where the two lines cross. A feature, like the island may pin point your location, but life is not always that simple. For accuracy take a third and final bearing, possibly a known island or buoy. You now have three lines on the map; they all intersect making a triangle. You are in that triangle, for sure. The smaller your triangle the more accurate you were in your readings, line drawing and land mark selection.

RANGES

Your careful chart preparations and speed/time calculations can be scrambled by the dynamic environment in which you are paddling in. The use of a "range" can help you stay on course while winds and currents push you around.

Imagine that you are paddling across a big lake to your destination that is due west. The wind is blowing forcefully from the north to the south. You dutifully paddle following your preplanned course, keeping your compass bearing. Meanwhile the wind has been blowing you to the south. If you maintain a heading following your pre planned compass bearing you will make land some where south of your intended landing spot.

Without a lot of fancy calculations and estimations of wind or current speed, the use of a "range" will keep you on course. *photo by Andrew Sigal*

Before you get too far on your route look for two objects directly in your course line. Look for something like a mountain or hill behind a river mouth. Or maybe you can see a large tree in front of a church steeple or tower. Any two fixed objects that stand one behind the other. Now you have a range.

If you see that the two landmarks start to separate than you know that you are no longer in line with them and not on your course line any more. You have been blown off your course line by wind or have drifted off with the current. Paddle up wind or up current to a point where the two landmarks are in line again and you are back on your course line.

You will find that you have to "ferry" your kayak across the wind or current. Point your bow up stream or up wind just a bit. The stronger the wind or current the more you will have to point. You will think that you are no longer going to your intended destination. You are, but you are just paddling against the wind or current as well.

Take note of your compass reading. You can still use your original course, just not your original bearing. You are now on a "heading." Use your heading to keep you on course. If the current/wind is relatively constant then this will be easy. Otherwise your heading will need to be checked and changed periodically.

Keep track of your range. Sometimes you will lose sight of one of your landmarks due to your changing perspective as you move along. Be ready to find new ranges as necessary. You will not be able to use a range if there is any possibility that visibility will decrease to a point where you no longer can see your land marks. If this is the case you will need to estimate current or wind speed and calculate your ferry angle and heading. Sorry but I cannot elaborate on this at this time.

TIDE TABLES AND COAST PILOT

For coastal paddling Tide Tables and a Coast Pilot, also known as Sailing Directions, will be invaluable.

Tide tables will allow you know when high tide, low tide and slack tides come. Also you will be able to see the tidal variation in height.

A Coast Pilot is a guide to navigating a specific area.

NOAA publishes these books for areas all over the country. The Coast Pilot covers many topics of interest to the mariner, such as local weather patterns, tidal currents, direction and strength of flow, hazards and landmarks that can be seen on shore from sea. They are written for the pilots of marine vessels, so you do have to "interpret" the information to suit a kayaker's needs.

FINDING YOUR WAY HOME

Looking back as you start your journey, and as you go along through its twists and turns, is one of the easiest things to do to keep from getting lost. After you have paddled a bit away from shore look behind you to see what your landing looks like when you head "home" or back to your starting point. That way it will look familiar to you on the way back and help guide you in.

It is surprising how different the same island or beach can look from different perspectives. Take a good look back any time you come around a point of land, circumnavigate an island, or paddle a significant distance. This way you will have taken lots of mental snapshots, and you will know the way back because you have seen it before. This will also work on hiking trails.

In conclusion, this is only an introduction to navigation basics. You will need instruction, practice and a good book (see below) & notebook for review to become proficient. Learn a little bit at a time as necessary and look for good instruction opportunities.

Navigation Terms

- Azimuth Ring = rotating outer ring on some hand compasses marked with degrees.
- Bearing = compass direction to a landmark.
- Chart = a detailed map for nautical use.
- Course = direction you want to go.
- Dividers = an instrument for dividing and measuring lines.
- Easting: The number used in UTM to define how far east or west the position is.
- GPS, Global Positioning System: A network of satellites and mobile receivers used in electronic navigation.
- Heading = compass direction boat is pointing.
- Knot = a nautical unit of speed measurement equal to 1.15 MPH.
- Map Case = a waterproof bag made for maps. Freezer quality, Ziplock type bags may do.
- NAD, North American Datum: Numbering system with in UTM. NAD 27 being the older and NAD 83 the newer.
- Nautical Mile = the average distance on the Earth's surface represented by one minute of latitude.
- Northing: The number used in UTM to define how far north or south the position is.
- Parallel Rulers = two rulers, or rules, hinged so that they are always parallel.
- Pointer = found on some hand compasses, turns with azimuth ring to align with compass needle.
- Protractor = a graduated, semi circular instrument for plotting and measuring angles.
- Range = Two fixed objects, one behind the other, in line with you and your destination.
- Scale: The ratio of distance between the "real" distances on the earth and the distance on the map. Example 1inch = 24,000 feet.
- Topographical Map = a detailed map for overland travel.
- UTM Grid Reader: A clear plastic sheet used to measure UTM coordinates on a paper map.
- UTM, Universal Transverse Mercator: The system used for creating coordinates used with GPS and topo maps. Expressed as NAD 27 or NAD 83.
- Waypoint: A location defined by coordinates from a GPS or read from a map.