



# Navigation begins at home

Basic navigation skills are essential for any trip into New Zealand's outdoors, even on short day walks. The key to successful navigation is knowing where you are, where you want to go and how to get there. Knowing how to read a map, understanding distances and walking speeds, and making navigational decisions are all part of it. It's important you get outdoors and practise these skills to become a competent navigator.

## About maps

Maps are essential to both your trip planning and navigation.

Knowing how to read a map is the best navigational skill you can develop. Understanding a map enables you to plan your route, estimate travel times, plan escape routes and gain a general understanding of the terrain.

- **Topographic maps** are ideal for bush navigation because they show natural features such as hills, rivers and vegetation, and artificial features such as huts, tracks and roads.
- **Phone-based topographical maps** that track your location may be sufficient on easy and intermediate tracks, so long as you pack a power bank. However, they don't like the rain, you'll eventually run out of battery, and using an app isn't helping to develop your navigation skills. For most trips, especially longer than a day and on advanced or expert tracks, an official topographical map is recommended. This is best for taking bearings and identifying land features in the distance. Paper maps don't run out of batteries either, and you can keep them waterproof by using a waterproof bag or laminating it.

You can get maps from outdoor retailers, online via LINZ, and DOC Visitor Centres.

You'll first want to familiarise yourself with the map at home during your trip planning by plotting your planned route. Then, when packing, fold it and place in an easily accessible place in your pack.

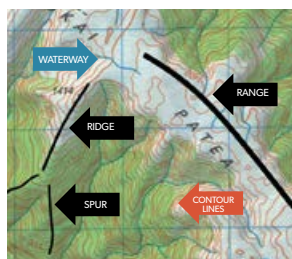
### ELEMENTS OF A MAP



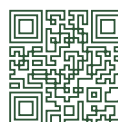
Map Scale 1:50,000



Map Scale 1:250,000



Thicker contour line with a number is to mark every 100m of elevation.



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## Estimating distance and duration

An important part of trip planning is judging how long the group will take to walk each section of the route.

A useful starting point is to see how long it has taken others. Read the track review in Plan My Walk, or check online for more track information. Be cautious as these comments don't consider your specific circumstances, your group's walking speed, or the weather you'll experience.

To customise it to your situation, look closely at your topographical map and divide the trip into segments between known points such as track junctions, bridges, campsites or huts. Based on these, and what you know of your group, estimate how long you think each section of your walk will take, ensuring stops for snack and meal breaks. Write this down and carry this with you when you're walking.

### ESTIMATING TIME

As a guideline, an average group will walk:

- 4-5 km/h on a smooth, easy gradient, wide track
- 2 km/h on a rough track, or even slower in untracked terrain or a track with fallen trees across it.

In addition to these walking speed estimates, you also need to add in time for elevation gain/loss.

- For every 100 m of uphill walking, add 20 minutes onto the time you've calculated above.
- For every 100 m of downhill walking, add 15 minutes onto the time you've calculated above

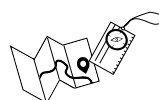
These times may vary considerably depending on the fitness level and abilities of group members, for example:

- Older people may be slower downhill than they are uphill
- Large groups generally take longer than smaller groups
- Young children may be nearly as fast as adults, but will need more breaks

In short, always allow more time than your calculation. Record your own walking times and develop rules of thumb that work for you, especially when carrying a full pack, or walking with children.

## Pack the essentials

Preparation is crucial and the items you take with you can make all the difference out there, such as tools to help you navigate and keep you safe if you do get lost. A few essentials to start with...



Map + compass or GPS



Phone + distress beacon



Headtorch + batteries



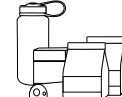
Waterproof jacket



Emergency shelter/survival bag



First aid kit + medication



Food and water

TURN OVER TO LEARN HOW TO NAVIGATE



# Navigation in the outdoors

## Using your eyes

Your primary navigation tools are your eyes and your ability to think.

While it is easy to rely on the more experience members of the group, it is important that each group member should be aware of where they are at all times and navigation decisions should be made as a group

On easy and intermediate tracks, the path is usually easy to see. On advanced and expert routes, you may need to look for track markers and other wayfinding signs to identify the route. These are generally in the form of plastic orange triangle markers nailed to trees on Department of Conservation tracks and most others that are managed by a local council.

The frequency of markers can vary. There may be one every few metres, or they may be only in places where the route is unclear. Above the bushline, or along river sections, where orange triangles are difficult to place, tracks may be marked with cairns (piled stones) or route poles. Sometimes these can fall over so if it seems to be in the wrong place, use your eyes to find the next one on the route.

- If you cannot see the next track marker, stop and ensure you are on the right track. You may need to turn around and head back until you find the last marker
- You may get the lie of the track from the markers placed for those travelling in the opposite direction.
- Markers positioned sideways usually suggest a turn.

You might also see fluorescent tape, ribbon, or other coloured markers hanging on branches. These are often used in biodiversity or conservation work and do not indicate the track. Do not follow them.

## Using the map

Map interpretation is about making a connection between the map and the physical landscape.

The key to effectively interpreting a map is to match the features on the map to the features on the ground, and vice versa.

- **Keep it handy, check it frequently and look for suitable terrain that you can recognise on the map.** Particularly when moving through unfamiliar or untracked areas. As you pass obvious landmarks you can easily identify your location on the map, and this is easier to do regularly.
- **Be aware of your location at all times.** This means knowing where you are as you move. It can be helpful to keep the map folded so that the area you are in is on top. As you travel, look out for key features like cliffs, clearings, track junctions and rivers, and use them to see where you are on the map.
- **It helps a lot to orient the map to your surroundings.** Use what you know about the direction of the track to rotate the map so that it faces the same direction. Then try to identify the land features you have seen around you on the map. This will help to give you an approximate position of where you are and what's around you.

To get more precise, some basic compass skills can help.



Stop to check your map with your compass.



Discuss your location on breaks with the group.



Make notes of timings as you go.

Triangle markers



Rock cairns



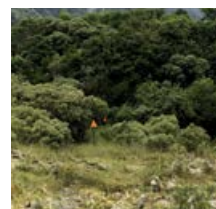
Marker poles



Marker poles in snow



Follow the orange triangles on trees. Some can be harder to spot due to age/moss.



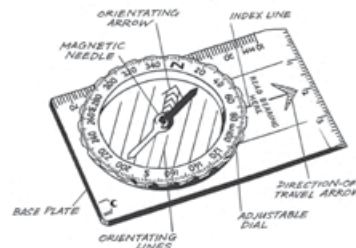
These can be larger on clearings and at river crossings to guide you across. Stop and look for them.



Do not follow other colour markers you see.

## Using a compass

The magnetic compass is an important aid to route finding, especially on more advanced tracks and routes. Progress to our eLearning guide or video series to learn more about how to use one. Scan the code below or visit [mountainsafety.org.nz](http://mountainsafety.org.nz)

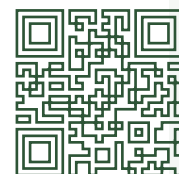


## Think you might be lost?

**Don't panic, this can happen.** There are some simple things you can do to get back on track. You can also prepare in advance with some useful equipment that will help in emergencies such as a distress beacon (like a Personal Locator Beacon), emergency shelter and extra warm clothing. The most important rule to remember if you are lost: stay put, don't keep wandering around. Watch our video on what to do on [mountainsafety.org.nz](http://mountainsafety.org.nz).

## Further learning

- Watch our videos in Get Outdoors Series
- NZ Bushcraft Manual, free on the MSC website
- Plan My Walk for finding tracks
- LINZ and TOPOMap for maps
- Herenga a Nuku Aotearoa for access maps
- Get training on these skills with a course or with experienced trampers.



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