



**WildlifeCampus**

Learn-Protect-Save



**Wilderness  
Navigation**

## **Contents of this course**

### **Module # 1 - Introduction to wilderness navigation**

**Component # 1** - Introduction to navigation anyplace wild

### **Module # 2 - Safety in the wilderness**

**Component # 1** - Safety management

### **Module # 3 - Direction in the wilderness**

**Component # 1** - What is direction?

### **Module # 4 - Our navigational toolbox**

**Component # 1** - Maps part 1

**Component # 2** - Maps part 2

**Component # 3** - Gadgets part 1

**Component # 4** - Gadgets part 2

### **Module # 5 - Navigational skills**

**Component # 1** - Navigational skills part 1

**Component # 2** - Navigational skills part 2

### **Module # 6 - Navigational challenges**

**Component # 1** - Restricted visibility

**Component # 2** - If lost



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If you'd like a certificate for a free course, you  
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No need to reach out, we'll contact you  
automatically upon graduation with the  
option to obtain your certificate.

## Disclaimer

This course was written by Andrew R. Friedemann and originally developed for the Southern African region. It has since been expanded to include global applications and audiences.

While every effort has been made to ensure the accuracy and usefulness of the content, it is not possible to cover every variation in terrain, navigation tools, or regional practices across the world. If certain details differ from your local environment or conditions, we encourage you to adapt the principles and techniques taught here to suit your specific context.

**This course is for educational purposes only. Neither the author nor WildlifeCampus accepts responsibility for any decisions, actions, or outcomes resulting from the application of the material.** Always use sound judgment, prioritise safety, and consult local experts or authorities where necessary.





## Welcome to WildlifeCampus

**Upon completing the full course, WildlifeCampus will automatically be notified and will contact you by email for your certificate information** (please check your junk/trash folders for emails you may have missed from us).

**No need to contact us to let us know you are done.**

### Important notes:

**Take the test on the top right-hand side** of the component page. This is where you will take the test once you have read the full component. Keep taking the tests until you complete all the components in the course. You will then automatically graduate.

**Download the PDF on the top right-hand side** of the component page. This is where you will download our course content in PDF format.

### An important note on our test questions

The assessment philosophy of WildlifeCampus does not require students to memorise thousands of facts. Instead, the tests are designed so that students come to an understanding of the material. You may find that certain questions are not based directly on what is presented in the content. But why is this so?

**Many of these questions have been deliberately set to be as ambiguous, obscure, subjective, challenging and confusing as possible. At some points, perhaps even frustrating.** The challenge on our side is to provide a quality assessment of the content without making it a simple comprehension of the text.

To this end, we attempt to make each question one that you must stop and think about. It is a device to ensure students understand and apply the content, but most importantly, to **come to their own conclusions.**

## Facts and a pinch of salt

Life sciences are not 'exact sciences.' In fact, mathematics is the only discipline that can legitimately claim the title of a 'pure science.' What we know and share with you in these courses reflects our current understanding—an understanding that is subject to change. The validity or 'truth' of these facts is, and always will be, open to confirmation, revision, or refutation.

Throughout these courses, you will encounter thousands of facts, whether about the ecology of rhinos or rhino beetles, but it is important to recognise that these facts represent our present knowledge. Inevitably, some of what we present here will, in time, be proven incomplete, partially correct, or even incorrect. Biology, by its nature, is a dynamic and ever-evolving field. While we strive to stay up-to-date, new discoveries, updated classifications, and paradigm shifts continually reshape our understanding. Accepted ideas are revisited and sometimes overturned, while others are reinforced and solidified.

The 'facts' presented in these courses are the product of countless contributions from a diverse range of experts, including botanists, zoologists, ornithologists, behaviourists, biologists, taxonomists, herpetologists, geologists, geographers, meteorologists, naturalists, photographers, entomologists, environmentalists, ecologists, ethologists, and passionate enthusiasts. These collective insights have been synthesised with our own research, observations, and interpretations to create what you see here.

As such, approach this material with a healthy dose of curiosity and scepticism. Science thrives on questioning, refining, and building upon what we think we know. Let this serve not as the final word but as a foundation for further exploration.

## Glossary

All fields of science and travel have a vast amount of terminology and jargon, with biological science having more than most. Therefore, during our courses, you may encounter many new words. This very comprehensive list will assist you. You have full access to our glossary, which can be found **under the academic tab on our homepage**.

If you would like for us to email you the glossary in PDF format, send us an email request: **[info@wildlifecampus.com](mailto:info@wildlifecampus.com)**



# **Module 1**

## **Component 1**



**Introduction to  
navigation anyplace wild**



## Author's note

**“To travel hopefully is a better thing than to arrive, and true success is to labour.”**

**Robert L Stevenson**

Our outdoors heritage provides recreational enjoyment for hundreds of thousands of hikers, trampers, hill walkers, backpackers and other outdoor enthusiasts every year. It also costs a fortune in rescue costs and the lives of many people annually. Many of these accidents are the result of poor navigation skills. It is not good enough to just have a map and a compass with you. You need to know how to use them in any conditions the environment may throw at you. Do not be naive and say, 'It won't happen to me'. It just might.

This course was written with the intention of saving lives by teaching skills. It may be the most valuable course you will ever read. I feel that if the course helps to save one life or prevent one rescue, it will be worth the 16 years it took to put together. Over the years, many people have sent me bits and pieces of information for possible use in this course. Where possible, I have personally contacted the originators of the work to ask for permission to reproduce their contribution, but in some cases, I simply could not find out who the original author was or was unable to contact them, so to these people, I hope you don't mind my borrowing your ideas. As the saying goes, 'Imitation is the finest form of flattery.'







Written originally for the Southern African region, this course has been expanded to include the entire globe. However, it is practically impossible to cover every eventuality, so if something is slightly different where you live, simply adjust what we teach here for your area.

**A VERY BIG THANK YOU** must go to my wife, Michelle, who has lived with this course for so many years and has given so much input to make sense of it all.

Thank you also to Sheila Bell-Cross for your patience in proofreading my ramblings.

Lastly, I wish to say a heartfelt **THANK YOU** to all who have contributed in one way or another in the development of this course, including all the guinea pigs who tried out ideas on various courses. There are simply too many of you to mention, but thank you to you all.

Be safe in the outdoors.

**Andrew R Friedemann**

MIA & National Mountain Leader/Guide



## Introduction to navigation, anyplace wild

**“ If you don't know where you are going, you will probably end up somewhere else”**

**Dr Laurence Peter**

Navigation is a skill that can be learnt by anyone. Early explorers learnt this skill as part of growing up and spending time with their peers in the outdoors. Our modern urban-based lifestyles, with roads, paths and signage, all contribute to our loss of the natural navigation skills we would have learnt in the past.

We even fit global positioning systems to cars and mobile telephones now to find our way around, reducing the need for navigation skills even more. But when in the unknown outdoors, the ability to navigate efficiently will enable you to determine your own position and the position of your destination and/or other features, both on the ground and on the map, and enable you to follow a suitable route to that destination or feature. Outdoor travellers especially need to be able to navigate accurately in all weather conditions and terrains.

Although navigation is an exact science, making it possible to learn skills from a course such as this one, in practice, it is sometimes a vastly different scenario. For example, your map or this course will not be able to determine the ability of your group, the weather conditions, or the exact nature of the terrain underfoot. Planning and your navigation skills must be flexible, and there can be no better teacher than experience in various terrains and weather conditions. Although this course has been written with the assumption that you are navigating on foot in the outdoors, the skills and techniques work just as well for 4x4 drivers, paddlers, cyclists and anyone else 'out there'.





## The choices

In order to navigate anywhere, there are a number of questions that must first be answered in order to establish the framework or scope of the activity we wish to accomplish. These are called the choices.

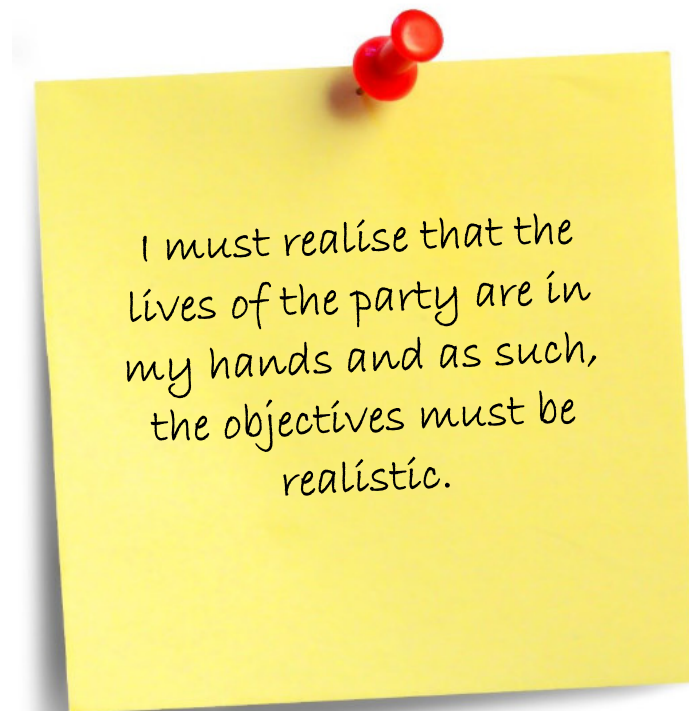
### Choosing an activity

What is your reason for needing to navigate an unknown outdoor area?

#### You may be:

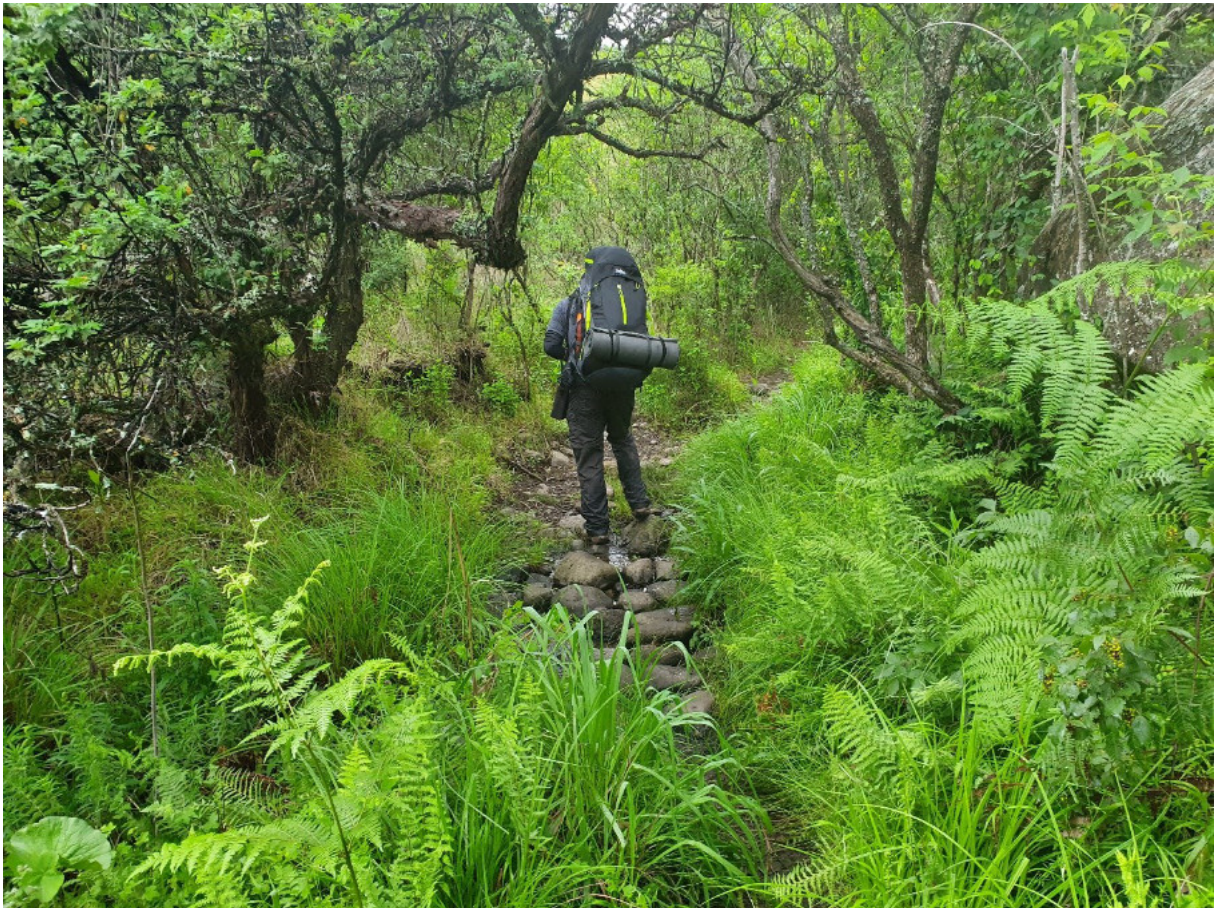
- 🍷 Exploring an area you have not seen before.
- 🍷 Taking part in an adventure race.
- 🍷 Studying flora and fauna or hunting.
- 🍷 Relaxing with friends.
- 🍷 Surveying an area for your job.
- 🍷 Simply taking a hike.

Your objectives will determine much about the trip you are planning, and it is important to choose the right reasons for the group. For example, a day trip leader will participate in a far greater number of activities and introduce a large percentage of first-timers to the outdoors than the more experienced leader. It is therefore vital that the leader chooses the correct activity and area, or they may inadvertently destroy the romanticism of the outdoors for many first-timers. An introductory first trip that gets confused, or is too difficult for the beginner, will put that person off the outdoors for life.



## Choosing an area

Not only is the reason for the trip important, but also the area should be one that can meet the requirements of the various activities the group would like to participate in, and also be suitable for the abilities of the weakest in the group. Some areas should only be accessed by the most experienced people, due to the harsh nature of the terrain. However, there are many other areas more suited to less experienced people.





## Choosing a time of year

Depending on the nature of the activity and chosen area, what would be the best time of year in which to plan the trip? Consider the weather patterns for the area at the time of year and plan for unexpected problems such as unseasonable weather, late flowering of plants, hot or cold temperatures and also the prior commitments of your intended group.





## Planning a route

**“A well-set track (route) is a work of art – sinuous or direct, steep or flat, angular or curved – that moves the party through the terrain with a minimum of effort and maximum speed. It uses terrain with great efficiency by gaining or losing elevation through contouring, smoothly circumventing difficulties, avoiding abrupt changes in direction or sudden adjustments in technique, and moving the party in as restful a manner as possible.”**

**Technical Manual for Professional Mountain Guides – Association of Canadian Mountain Guides.**

Before setting out on any journey, whether in the mountains or in a city environment, a plan is vital to ensure that you and your party arrive at the destination using the best route. The main requirement of any route is that it must be safe and that the whole party should be able to achieve the objective.

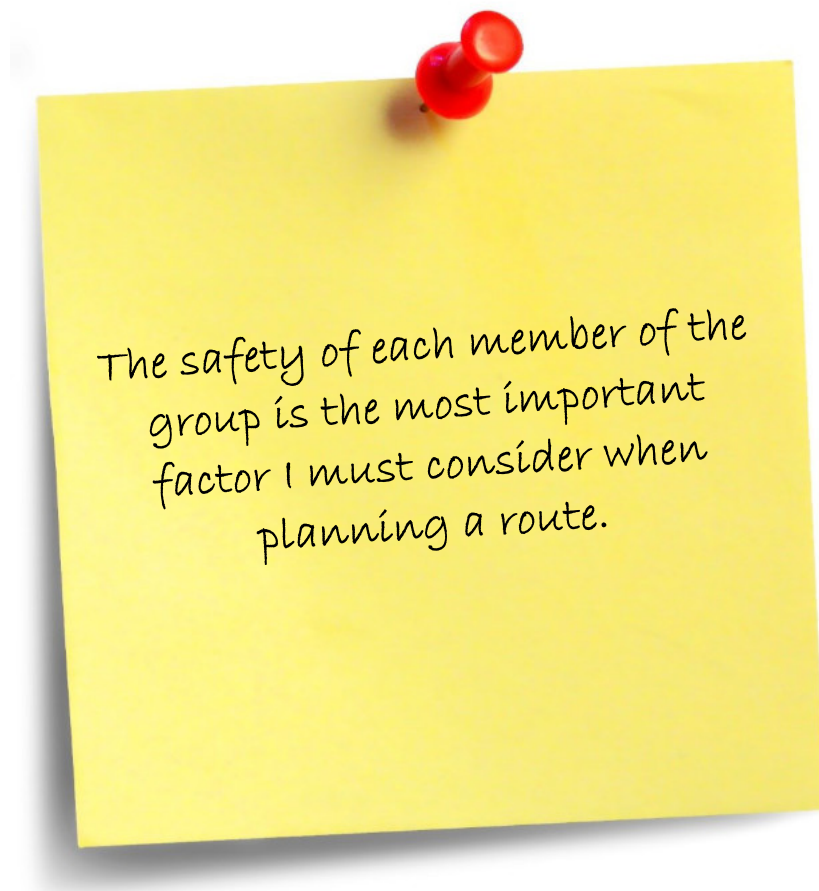
Some groups intend to travel far and fast, whereas others only want to enjoy a quiet stroll. These groups each have their own objectives and should not be compared.



## Route finding

Route finding is the general process of choosing an overall objective and following the best route to get there. This consists of identifying objectives, researching, planning and preparation, but once in the field, the potential route identified in planning the trip is compared to the reality. This reality includes actual observed conditions, difficulties and hazards, which may not show on a map. Intuition plays a big role in route finding, so experience in the field is important before undertaking long journeys.

In other words, the route must be the result of careful map study and should satisfy the objective of the trip and time available, as well as providing for ease of movement and navigation based on local conditions.





## The best routes follow linear features

Examples of these include paths, streams, ridges and valleys. Next, it is best to select route waypoints that represent elevation changes of at least two contour intervals, such as hills, depressions, spurs, and draws. Reliance upon manmade features and vegetation is not recommended because they are most likely to have changed since the map was last revised.

Waypoints are located at places where changes in direction are made and mark your 'steering' points. During route planning, it is especially important to review the route and anticipate where mistakes are most likely to be made so they can be avoided.

Following a valley floor or proceeding along the crest of a ridgeline will generally offer easier movement and good navigation waypoints. It is best to follow terrain features whenever you can.

During your planning stage, it is important to determine the approximate timing for arrival at each of the waypoints or steering points. This will enable you to judge your progress and establish whether you are behind or ahead of time, and make any necessary adjustments to the route or group speed.





## Deciding factors

Depending upon the size of your group and their skill levels, several factors should be considered in selecting a route.

### These include:

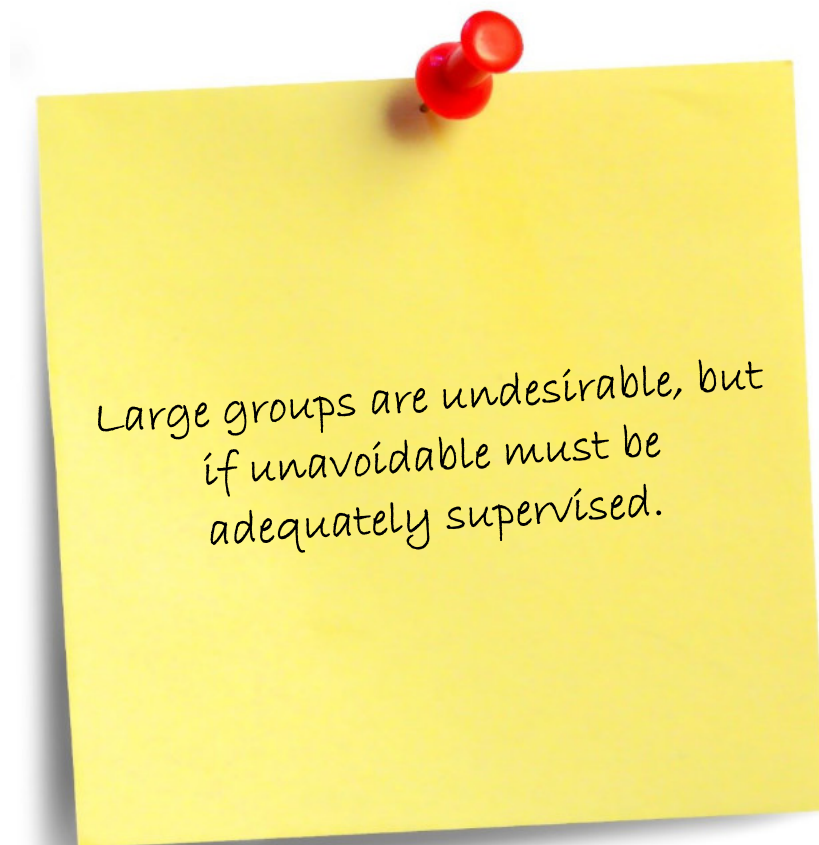
- 🌿 Travel time available.
- 🌿 Travel distance to be covered.
- 🌿 Conditions underfoot.
- 🌿 Availability of logistical advantages such as water, campsites, shelter and so forth.
- 🌿 Party size and composition.
- 🌿 Your objective.
- 🌿 Make sure the weakest member of your party will be able to cope with the trip.



The group size and composition of a trip are often determined by need.

**However, there are guidelines we should take into consideration:**

- The distance to be travelled.
- Possible weather conditions.
- How many members of the group are experienced.
- The area you will be in.
- The fitness, ages and gender of the party members.
- Restrictions placed by the authorities as regards party size.





Solo trips are unwise and are not encouraged in any circumstances. In difficult or serious terrain, the ideal party size is four. This number keeps the party agile and manageable. As a rule, a 12-strong group is about the most any one leader can effectively lead. Of these, only three to four should be inexperienced children or eight experienced children. Ideally, no party should consist of less than four hikers so that in the event of injury, one can stay with the injured member and two can go back for help. Large parties tend to be slow, difficult to manage and have a high impact on the environment, particularly at campsites. For school parties and inexperienced groups, there should be one experienced member to no more than five walkers, and one qualified leader to no more than 12 walkers, with at least two leaders regardless of party size.





## Gathering information

The most important step in planning a route is to gather information about the area.

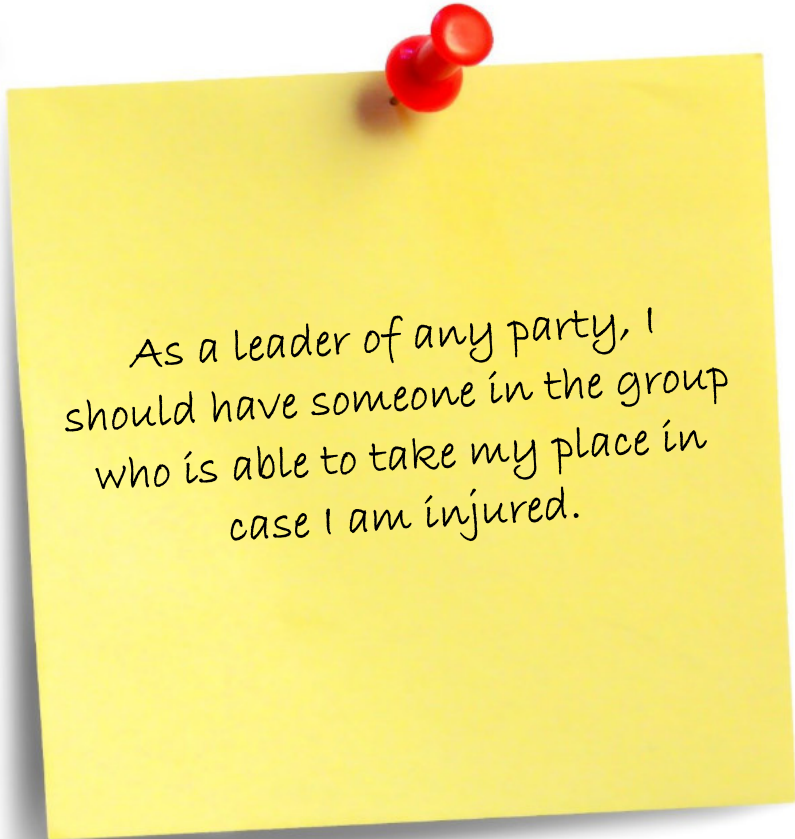
**This list includes some of the things you may need to do:**

- 🗺️ Collect maps and route guides. Possibly aerial photos too!
- 🗺️ Ensure the roads are accessible.
- 🗺️ Obtain weather reports.
- 🗺️ Local knowledge is the most valuable knowledge you can have, so ask for information from people who know the area.
- 🗺️ Find out about possible difficulties, such as route finding, thick bush and dangerous animals.





- 🗺️ Check the nature of the terrain, water availability, trail location and condition (if any), and possible campsites. Plan your trip distances, and do not attempt too much in the time available. (see Naismith's rule)
- 🗺️ Allow for the unexpected. What if... rivers can't be crossed, there is no water at the campsite, or one of the group members falls ill or is injured?
- 🗺️ Note possible escape and alternate routes (in case of bad weather, illness or injury, fire, and so on).
- 🗺️ Always carry shelter on overnight walks, even if you do not intend to use it (huts and caves may be occupied, or flea-infested).



As a leader of any party, I  
should have someone in the group  
who is able to take my place in  
case I am injured.

## Time available and estimates

**Time and time again I hear of miserable nights spent in the rain or crammed under a tiny overhang because a group could not find their planned shelter. In almost every case, they had not gone far enough. They had underestimated their walked distance and had camped out in the open after assuming that they had gone too far.**

Estimating the length of your trip and the time it will take to complete requires a considerable amount of experience, but it is based on a few criteria, which should be considered.





## Nature of the terrain

The terrain you plan to cover is probably the most important aspect that will determine the distance you can cover in a day. On flat, easy ground, it is quite possible for an adult party to cover four to five kilometres an hour, but on steep or rocky ground, this can sometimes be reduced to around two kilometres an hour, or less. With inexperienced walkers, it would be unwise to lead a party in terrain that is so rough that your time is even slower than this. Leave this terrain to experienced parties. Other terrain factors that may affect your speed could include thick vegetation, wet/muddy ground, steep ground, snow and eroded pathways.



## Fitness and experience

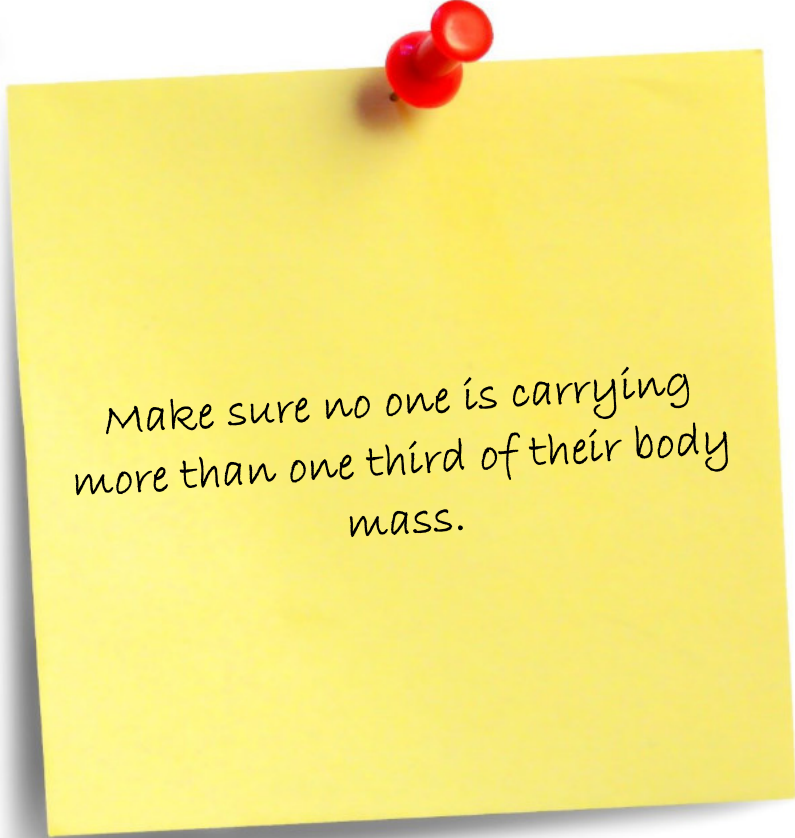
An experienced party will obviously be able to cover more ground than a party of novices. Allow time for inexperienced members to have frequent rest stops and exploration opportunities. An inexperienced walker will have a lot of acclimatisation to do to get used to the unfamiliar terrain, equipment and exercise.





## The weight of your equipment

Before leaving the trailhead, it is vital that you check that everybody has the correct equipment and that no one is loaded down with extra unnecessary gear. Novices always tend to pack a lot of unnecessary gear, and it is part of the group leader's job to coach them on correct gear selection. The weight of the individual packs will have a marked influence on the walking speed of the group, so take this into account when deciding how far to go. A heavy pack can slow a hiker down by as much as two kilometres per hour or more, so if it is necessary to take heavy equipment, allow for this in your estimates.



Make sure no one is carrying  
more than one third of their body  
mass.

## Expected weather conditions

Cool, clear weather is far more suitable for covering long distances or strenuous ascents than hot temperatures. Investigate what the expected weather will be like before your trip by obtaining a long-range weather forecast from the weather bureau or the Internet, and talk to others who may have done this trip before. Factors likely to slow you down are wet and humid conditions, wind, poor visibility and high temperatures.





## Estimating time of completion

Taking the above factors into consideration, it is possible to get a very good idea of your estimated time of completion and, more importantly, how long the trip for a group should be. Always allow a safety margin by over-estimating time rather than trying to be absolutely accurate. You can never know what the actual conditions will be that could slow you down. There is little more demoralising than still walking at night over unfamiliar terrain because you are behind time.



## Adjusting your time estimates

While out on a trip, it sometimes happens that your estimates are incorrect because of one or a combination of factors. It is important to then adjust your time estimates to ensure the trip is still successful and that you do not lose control of the group. Specific methods will be discussed later on in this course.

Firstly, after realising that your estimates are incorrect, you must determine your exact position and what your speed over-ground has been up to that point of the trip. (Distance covered divided by the time taken.) Take a close look at the map and determine if your speed is likely to remain the same for the rest of the planned day's walk. It may occur to you that you have to find an alternate campsite from the one planned or that you must increase your walking speed to cover more ground. Remember that you can only travel as far and as fast as the weakest member of your group. It is a group effort, and you must stay together. On a multi-day trip, you may have to use one of your alternate routes to shorten your trip if you find that you will not be able to cover as much distance as you had planned. Keep the group informed of your decisions. Estimating time and distance is a skill that can only be learnt through experience.





## Turnaround times

On every trip, whether day or multi-day, and you need to return to a certain point at a certain time, it is necessary to work out a 'turnaround time'. This is the latest that you must begin the return trip in order to make it back on time. On a single-day trip over consistent terrain, the turnaround time should be at about 60 percent of the available time. Coming down is usually a bit easier, as you know the route and it is downhill. The actual terrain will also affect this. Remember that if you are dropping into a valley for the day and have to climb out again in the afternoon, you may need to change this to a 40 percent rule instead, as coming up out of the valley will take longer.


As an example, if you were doing a day trip up a peak which takes approximately 10 hours, and you know that the final summit section is slow as it involves some scrambling, then you may want to have two turnaround times: the first just before the final summit scramble and the second on the summit. Work out the time needed for the summit scramble (up and down) and subtract this from the total time. Assuming this will take two hours, this leaves you eight hours for the rest of the trip. With the 60 percent rule, this means you must be at the start of the summit scramble after 4.8 hours from the start. If you are not, then turn around and do not start the summit section. If you are on time, then you have approximately 72 minutes in which to reach the summit based on the 60 percent rule. If you are not at the top in this time, turn around.



## How to calculate your turnaround time

<b>Total time estimated for the trip:</b>	10 hours
<b>Less summit scramble (up and down):</b>	2 hours
<b>Remaining time:</b>	8 hours
<b>60 percent of 8 hours:</b>	4.8 hours to get to start of the summit scramble.
<b>60 percent of 2 hours:</b>	1 hour 12 minutes to get to the summit.

Therefore, assuming you start at 6 am, you should be at the start of the summit scramble by 10:48 and on the summit by 12 noon. If you are not on time, turn around to ensure you get back to the start on time. On multi-day trips, times would be based on daily as well as overall targets. If on a 10-day trip, you are not halfway by the end of day five, you may need to adjust the route or speed up the group.



Remember: Party members  
will be watching me and will  
someday lead by my example,  
so I must make sure I get it  
right to let them enjoy the  
experience.



## Access

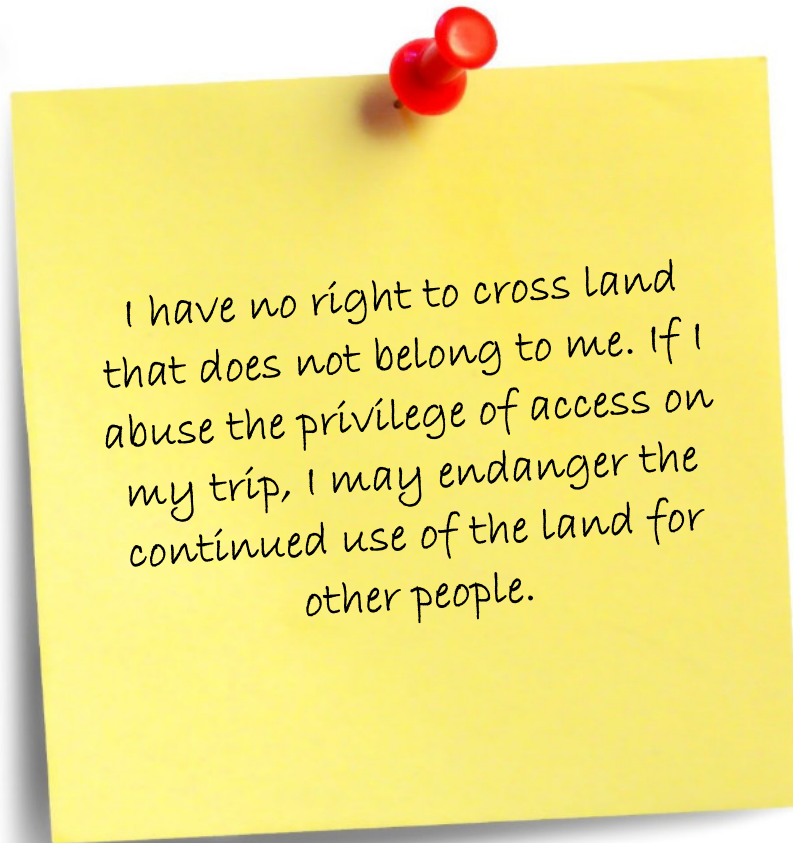
**“Let us not look back in anger nor forward in fear, but around in awareness.”**

**James Thurber**

In many countries, most activities are done on state-owned or controlled land, and access to these areas is strictly controlled, and access permits are required. These restrictions and permits are not intended to keep all people out, but to control the access of too many people into these areas.



This would cause damage to the ecology of that area and also hamper the activation of the necessary help if you or your party should get into difficulties on your trip. Many areas used are also privately owned, and the owners grant permission to use their land. Unless otherwise identified, make sure you contact the landowner for permission to use an area. Before starting to plan a detailed route or any other planning, find out who owns the land and get their permission to use it.





## Selection of campsites

One of the great things about an outdoors trip is being able to get away for a few days. This means that we will need to find somewhere to camp, be it a tent, cave, refuge or available local accommodation. Selecting your camping spot is part of route planning, in that you need to have determined beforehand where you intend to stop for the night.



Selecting a campsite from a map is not just a simple task of finding a flat site in roughly the right area; it is a vital part of route planning.



**There are a number of factors to consider:**

Access to water. Unless it is necessary, it is always preferable to camp near water or to have access to a good water supply, but:

- 🕒 Never camp in a dry riverbed because of the danger of flash floods.
- 🕒 Always try to camp on the side of a river that will not cause your intended route to be blocked if the river floods. Be on the side you wish to be on in the morning.
- 🕒 Be aware of the possibility of becoming trapped between two rivers.
- 🕒 Be aware of pollution from habitation upstream.
- 🕒 Shelter from the wind.
- 🕒 Possible lightning strike zones.
- 🕒 Flat ground.
- 🕒 Local habitation, you want to maintain a minimum impact.
- 🕒 Permissible camping areas.
- 🕒 Reasonable distance from your start position





Maps can be a valuable aid in selecting a campsite, but do not tie yourself down to exact planning on a map – you must be able to be flexible in case you find the actual terrain you selected unsuitable.

