free.zero
WORLDWIDE PARAGLIDING AND PARAMOTOR MAGAZINE. FOR FREE.

LANDING OUT, WHERE AND HOW?

Photo: Francis Cormon

Photo : Niviuk

LANDING OUT

When a pilot goes off on his first little XC flight on a paraglider or a paramotor, he needs to be able to choose a place he doesn't know as a landing field and to land safely…

By Sascha Burkhardt
Translation Ruth Jessop

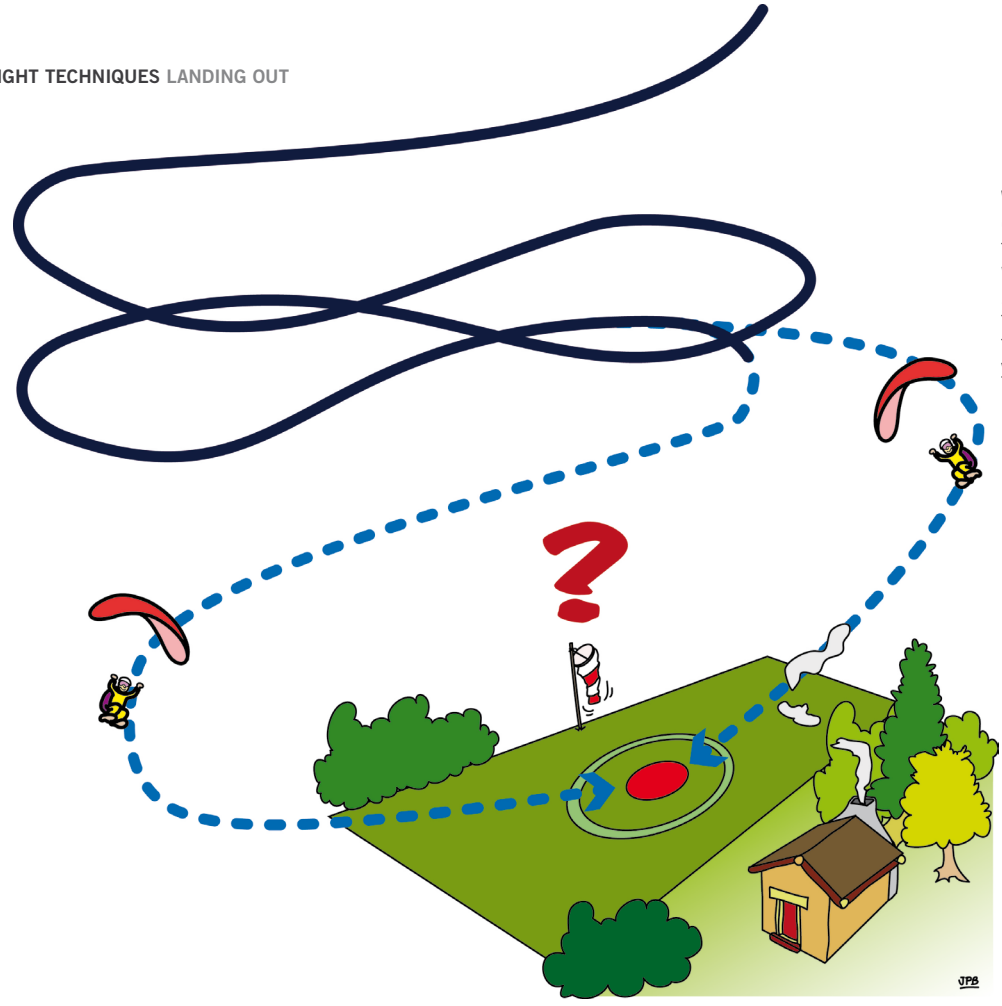
Landing somewhere you don't know requires a good analysis of the situation, well before your final approach. Even for an emergency landing, it's best to think as much as possible about your approach. You need to make decisions faster and faster as the ground comes up towards you. To be as ready as possible for these situations, it is in the pilot's interest to be constantly analysing the relief, the meteo wind, the valley breeze and the thermals. And of course, always keep an emergency landing field within reach and have an escape route or plan B in case, at the last minute, the place initially chosen turns out not to be suitable.

Watching out for thermals – no problem. In paragliding XC flying, that's what we look out for, and use all the time. Due to their force and their turbulence, certain emergency landings are not recommended. For example a meadow just above a cliff, the break in terrain acting as a thermal trigger, will be more turbulent than a large space devoid of thermal contrasts. At the same time, at the bottom of the valley, the thermic breeze can give rise to strong valley winds. If that's the case, to land out, it's better to choose a clear slope higher up, even if you'll then have to walk several kilometres on foot. On a paramotor, fortunately, pilots fly mainly at times when the wind and the breeze are weak and it is less likely for them to have to walk with 30 kg on their back.

As for paragliding at times of strong thermal activity, there is nothing to say that the valley wind will necessarily be coming up the valley. The meteo wind and the thermic breeze can sometimes interact to give surprising results.

When the water is moving, even slightly, it is unthinkable to risk a water landing.

Photo: APCO



When there is very little wind, it isn't easy to determine its direction. Small details can help you to decide. During every landing, there will be a point when you have to commit, and if you find yourself going downwind, you'll have to go with it rather than trying to change your direction only 20m above the ground. In the end, landing diagonally can gain you a few metres.

Diagram by Jean Paul Budillon

We need to be constantly thinking about all the possible flows that could be going on around us and beneath our feet, to correctly judge the situation. By talking to local pilots before taking off, you'll be able to identify potential hidden traps at a particular flying site.

To improve our analysis, there are lots of clues which help us to visualise the strength and direction of the wind and breezes. The most commonly given example is smoke coming out of chimneys but, though very precise and visible this indicator isn't available during the summer months. A better indicator is the surface of a stretch of water where the size of the waves gives away the strength of the wind. Its direction is even easier to read and clearly identifiable from the first breath of wind. By the upwind banks of the lake, the edges are smooth and without waves. On the other hand, banks lapped by the waves are on the downwind side of the lake.

Another indicator, especially in the flats, which constantly shows the wind direction, are wind turbines which are becoming more and more common. These machines turn and face straight at the wind, and when it changes, they respond quite quickly.

For flatland pilots they have become one of the most often used indicators.

Obviously, listening to paragliding federation wind-talkers, as in France on 143.9875 for example, gives a good idea of the general situation dozens of kilometres all around. There are some exceptions: Certain wind-talkers, in particular weather conditions, end up downwind of an obstacle and in the rotor, but local pilots will know about this and should tell you.

More locally, and close to the ground, the leaves on the trees indicate the direction of the air flow; the underside of the leaves are whiter than the top surface and are seen facing into the wind. This indicator works for moderate winds.

When it is really strong, the trees bend away from the wind and there is no longer any doubt.

Knowing the speed and the direction of the wind down to ground level is important for two reasons. Firstly, the shape of the cone of safety for landing depends directly on it. Downwind of the landing its sides are much steeper and you need to be nearer to vertically above the site than when upwind of it. It's logical, because your glide angle relative to the ground decreases strongly facing into wind. Secondly, to make a site usable, you need to know where the wind is coming from, so that you can land into the wind (or slightly cross wind) and that you can recognise the lee-side zones (houses, a hedge of trees).

The surface of this lake shows the local aerology perfectly. Little waves are touching the bank level with the kayaks and so the wind is coming towards the pilot. But the little smooth areas next to the pedalos and the dinghies show that there is a component of wind coming from the left of the picture. The pedalo beach is probably in the lee of the trees. Landing on the beach a bit further up where the grass is brown, flying towards the left of the photo, the pilot will land nicely in clean air!

Photo: Sascha Burkhardt

AT THE BOTTOM OF AN URBAN CANYON

At Sportono in Liguria, the pilot, pseudonym gan04, couldn't get back to the official landing field. He filmed his misadventure whilst desperately looking for a little bit of ground to land on. He touched down more or less ok...on the road. Landing facing into the traffic made it easier to avoid a collision.
Youtube: http://goo.gl/e5NxB

screenshot: gan04/Youtube

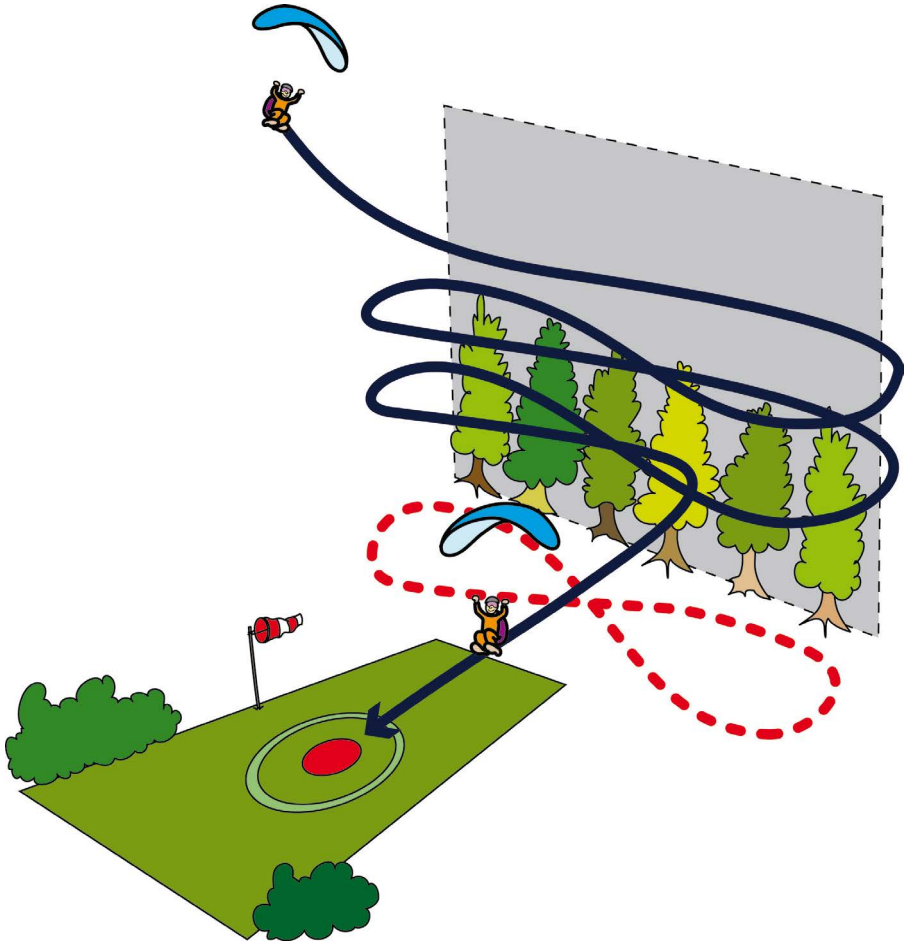
OBSTACLES

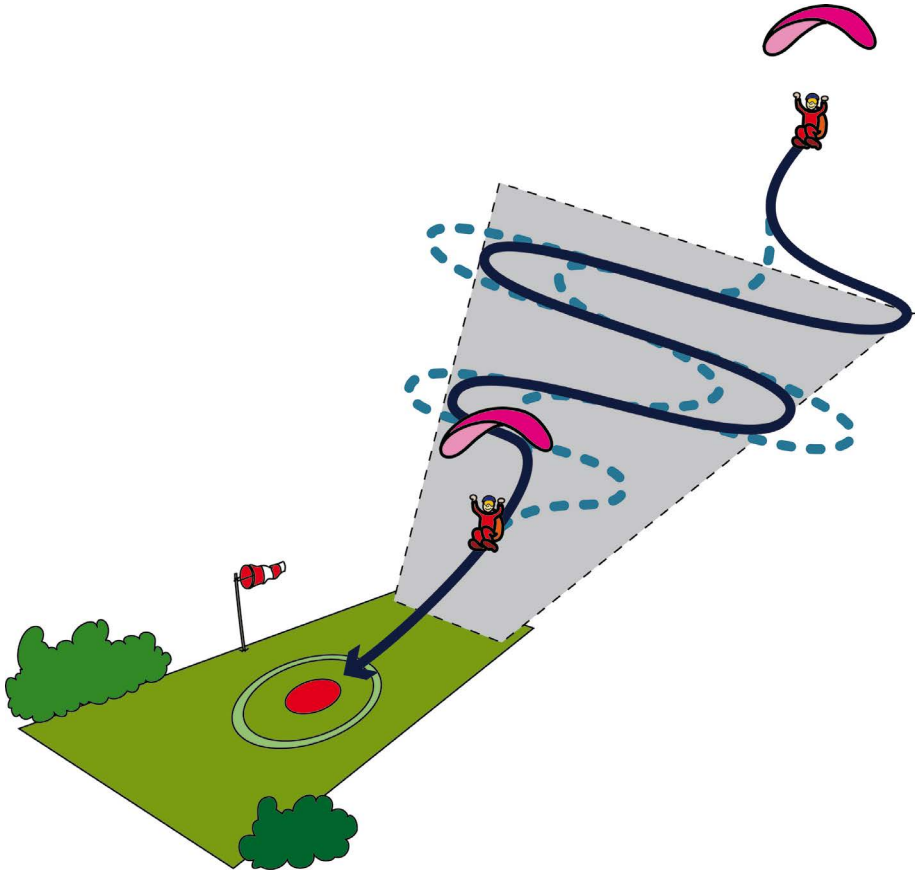
Throughout the entire approach, watch out for obstacles on the ground and around you; the most dangerous are power lines or cables. Logging cables (used to transport wood from where it has been cut in the forest to the road) as well as anti-avalanche cables (used to transport explosives to set off avalanches in winter) are very dangerous because they sometimes traverse long stretches without pylons. As with power lines, it's a lot easier to see masts and pylons than cables. If you see a nice line of pylons, there is every chance that the cable will follow the same line. But for power lines, it isn't an absolute guarantee; sometimes, secondary lines branch off to the right and left. You need to stay vigilant right up until you have landed!

Apart from anything else, you need to be ready for this type of obstacle to appear suddenly. Always have a plan B in mind, a well defined escape route which you can easily put into use.

A nicely aligned path and row of posts, leaves a landing out option without any risks to their right, doesn't it? No, instead there is a nasty trap. Barely visible, two electric lines cross the field in parallel. It isn't unusual either that a line will branch off or turn 90°. You need to stay vigilant right to the end…

Photo: Sascha Burkhardt





Setting up

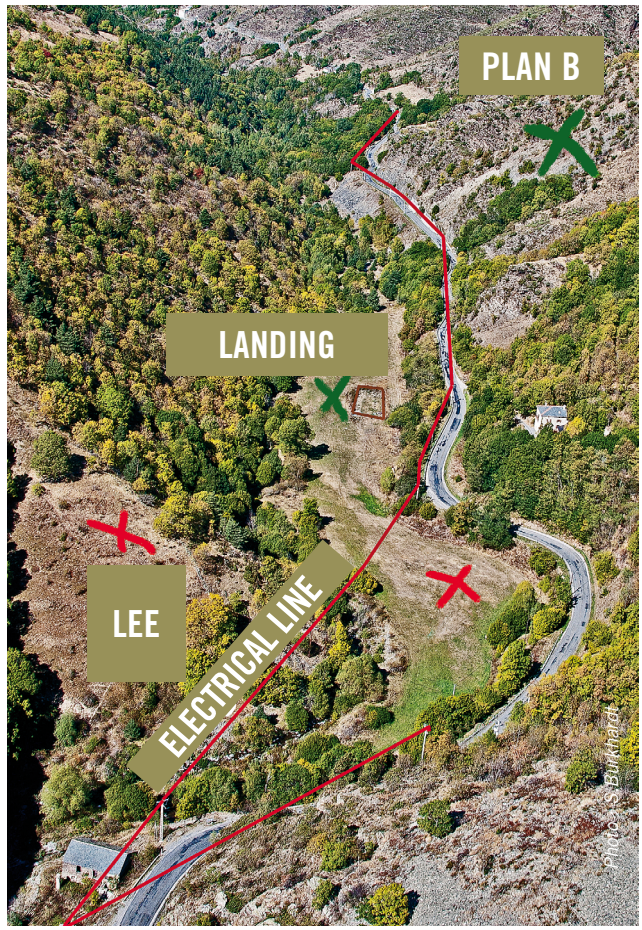
As a general rule, a figure of 'S' or '8' approach is necessary when landing out; a traditional figure of 'U' approach rarely applies. If there is sufficient space at the entry to the landing field, a figure of 'S' is preferable to a figure of '8', the turns aren't as tight and you're less likely to lose sight of the various landmarks. The steeper the turns, the more they become inaccurate and adjusting your height becomes more difficult. Over braking near the ground is one of the main causes of accidents because, as you approach the ground, the spatial and time margins diminish very rapidly. You have less time to react, and less space in which to correct your trajectory, just at the point in the flight when you want to have maximum stability.

The pilot loses his points of reference, applies the brakes too much, and ends up penduluming badly near the ground. Worse still, he tries to finish an already over-tight turn, but without enough space to avoid an obstacle, and stalls the wing asymmetrically, which often ends very badly.

To land out well, pilots used to soaring near to the ground have a clear advantage. They'll be less easily put off by the speed of the ground passing under their feet when there is a side wind or even a slight tail wind during a figure of '8' approach. *(Continued on page 10)*

Drawings: Jean Paul Budillon

The very antithesis of landing out, landing on the 08 of an airfield on a paramotor…
Photo: Jan Schäfer



LANDING OUT ON A PARAMOTOR

An example of the method used for landing out…

'I am flying over a narrow valley, and of course that is exactly the place where the motor stops. I try to restart it, nothing. I'll need to land at the end of the valley in a medium sized field, but with a power line running across it. It's just before midday so I would expect there to be a valley wind (the lowest part of the valley is at the top of the photo). The slope on the left is in the lee. The power line cuts the field in two and I risk being a bit long as the angle of the slope is difficult to estimate from the air. It's better to hit, at worst, a tree at the end of the field than the power line in the middle. Landing in the first half of the field, despite its width, is thus out of the question. Conversely, in a strong valley wind, there is a risk that all the terrain downwind of the bend in the valley could be in the lee. In this case, plan B would be a cross- slope landing on the nicely cleared area on the right.

Finally, the valley wind is sufficiently weak for me to land on the left of a fence in the middle of the field that I had spotted early enough. Also, I was lucky: The cows were heifers without a bull, and I was able to take off again once I had put the cap back on the spark plug…By spreading my wing out a few metres in front of the power line, I had enough space to fly over the trees at the end of the field. The breeze was strong enough to help as I inflated on the gently sloping field, but not enough to produce any turbulence in this enclosed valley. During the take off, I anticipated a tree landing if there were any mechanical problems at the end of the field, as the little cleared slope to the left of plan B wasn't visible for the first few seconds of the climb…'

(Continued from 8)

Pilots not used to turning near the ground can tend to brake too much to reduce their speed which seems really fast near the ground…In addition, pilots used to soaring are used to an L shaped approach and to landing cross wind, all of which can be very useful when landing out…

THE GROUND APPROACHES, MEET THE WIND GRADIENT…

Near the ground, there comes a point when the pilot needs to commit to flying within a narrow band. A few metres from the ground, it is better to take a tumble with the wind behind you than to attempt a U turn…Obviously a slight correction to the trajectory is possible and desirable, to get to a piece of land running diagonally, even if the wind is at 45° or more. But steep turns are out of the question. The more the pilot descends, the less margin he has in the brakes.

In any case, you mustn't slow down too much because, near the ground, you will usually encounter a wind gradient.

Approaching the ground, the pilot will go through layers with less and less wind due to friction of the air with the ground. Rough ground doesn't necessarily produce a stronger gradient than smooth ground; it's a question of viscosity. When you go through layers where there is less head wind, the wing temporarily loses air speed and also lift. It therefore comes closer to stalling.

Photo: V.Burkhardt, pilot Sascha Burkhardt

On a tandem, the pilot has even less margin for error. A good landing needs an approach well thought out in advance. You can't make it up as you go along on a tandem!

Turbulence from an obstacle, or a thermal coming up from the ground, can be the final straw which stalls the canopy.

For this reason, you need to keep a good speed coming in to land. That doesn't mean hands off the brakes. It may be necessary to keep a certain amount of pressure in the wing so that the leading edge is more stable in turbulence.

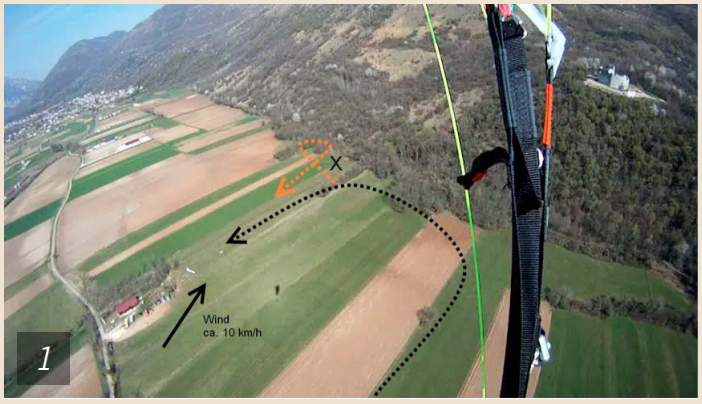
As is always the case in aeronautics, you need to find a good compromise.
To go back to the margins which become increasingly small nearer the ground, there may come a time when the pilot should even think about a tree landing. It is much less serious to land in a small pine tree than to stall at 10 m above the ground in a vain attempt to avoid it.
(Continued on page 16)

Great, a nicely cleared field for landing out with only one animal in it. Bad choice: A cow on its own is generally a bull, so it would be best to choose the next field. Even though it is more populated, it would be more peaceful…

Photo: Sascha Burkhardt

TRAGIC ACCIDENT AT MEDUNO

The German paragliding federation, the DHV, has published the analysis of a fatal accident, reconstructed using the footage from a GoPro. This moving account shows that it is extremely important not to get fixated on just one landing field, risking heavy-handed piloting. In this case, it was even more tragic because there were numerous alternatives to the official landing field within easy reach. Moreover, just before the accident, the pilot had changed paraglider, the new wing had a shorter brake travel than his previous wing.



In black, the normal approach: in orange, the trajectory the pilot seemed to want to follow after realizing that he was going to arrive too high.

About two seconds before starting to turn right, the pilot realized that he was far too high to turn and do a final glide to the left.

Two crucial errors; the pilot slowed the wing down considerably by putting on a lot of brake on both sides. He also put in a right turn, no doubt to come back to the landing field with a 270°. Without a doubt, it was seeing the ground going past very fast as he did this downwind leg, as well as the wish to get back into the wind as quickly as possible…

…that encouraged the pilot to brake more on the right. This over-braking provoked an asymmetric stall, followed by a violent dive very close to the ground.

Screenshot : DHV

LANDING IN A CANYON

Youtube: http://www.youtube.com/watch?v=RK1eapcBfwI

An adventure this German pilot could well have done without. He was caught out by a change in the wind and had to land in the bottom of an inaccessible canyon in the Italian Dolomites. Here he recounts the incident: 'A storm in a neighbouring valley caused a change in the wind. It was impossible to get back to the correct side of the mountain. At first, I thought about a tree landing but, in the end, I was worried about ending up stuck in a tree in this deserted valley. Seen from above, one would have thought it was a river bed of pebbles. I saw too late that it was a boulder field full of huge rocks.' It would perhaps have been better to have chosen a tree, because of the high probability of getting seriously hurt. Having a broken leg at the bottom of a deserted ravine is without a doubt, less preferable to a tree landing…The pilot was lucky; he didn't get hurt. All the same, the helicopter took seven hours to get him out of there…

Realisation: The wind has switched round to the south and it is impossible to get out of the trap.

He needed to make a decision: A tree landing or land on the 'pebbles' in the river bed?

The situation gets worse. Now the pilot is in the lee and the air is turbulent.

The scree on the right isn't possible: More than 40° and scattered with big rocks.

The pilot continues along the river. There too, the 'small pebbles' seen from above, turn out to be huge boulders.

Piloting to the millimetre: Above all, to avoid catching a stabilo, which would result in a violent turn.

At this point in the landing, you can only make corrections very sparingly to avoid the biggest rocks. The pilot tries to optimise his flare so that he lands as slowly as possible.

In amongst his bad luck, the pilot was lucky; he landed in one piece, with just a small sprain. All the same it prevented him from climbing the rocks lower down to get out on foot. The helicopter came seven hours later.

(Continued from page 11)

Trees

Incidentally, trees are generally a lot friendlier than screes, if the return to the ground is likely to be precipitate. For this reason, paramotor acro pilots like Sylvain Dupuis deliberately fly above forests to do their exercises. This is particularly the case for conifers like fir trees whose branches, sloping downwards, break a fall more easily by giving way, little by little, under the weight of the pilot, branch by branch. On the other hand, they don't hold onto the lines as well, and the pilot suspended from the tree will be less secure…

As for which bit of the tree to aim for (if the pilot doesn't arrive tangled up under his reserve), there is conflicting advice. Some think it is preferable to wrap yourself around the tree, and grab the outer branches, to soften the impact. For others, this technique could, if only the stabilo gets caught, turn the pilot violently without holding him high up. They recommend, instead, aiming for the middle of the tree.

In all cases it is advisable, after doing a small flare and just before the impact, to put your hands over your face. The reason for this is to protect the pilot's head but also, by doing this, the pilot lets go of the brakes and his wing has a good chance of flying over him and landing in the tree rather than falling behind him.
This way the numerous lines caught over the branches will ensure that he doesn't fall from the tree whilst waiting to be rescued. Then, he should quickly grab the branches or the trunk and hold on.

Who's frightened of the big bad tree?
However, conifers make a good alternative to landing on rocks…

Photo: Ozone

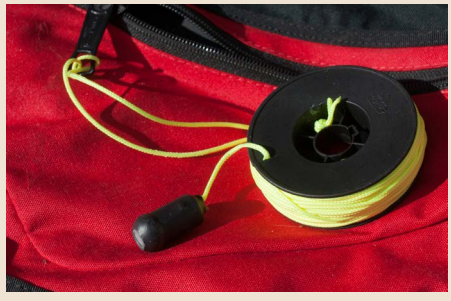
A bit of relaxation after the stress? Pulling the lines out of the tree after the incident. The leafy branches aren't bent towards the ground, but instead reach up to the sky, anchoring the lines more securely. Photo: Arnaud Dréan

Once in the tree, ideally the pilot should secure himself using a tree survival kit, which can easily be put together and carried in the side pockets of the harness. Put in a strong piece of rope about three metres long to attach yourself to the trunk, as well as a thinner piece of cord about 20-30 metres long so that you can pull up a proper climbing rope when the rescue team arrive.

Don't try to climb down the tree without a proper rope. There have already been fatal accidents from falling after successful tree landings. In areas where there is a big risk of getting stuck up a tree, some pilots carry their own climbing rope.

PLANNING AHEAD

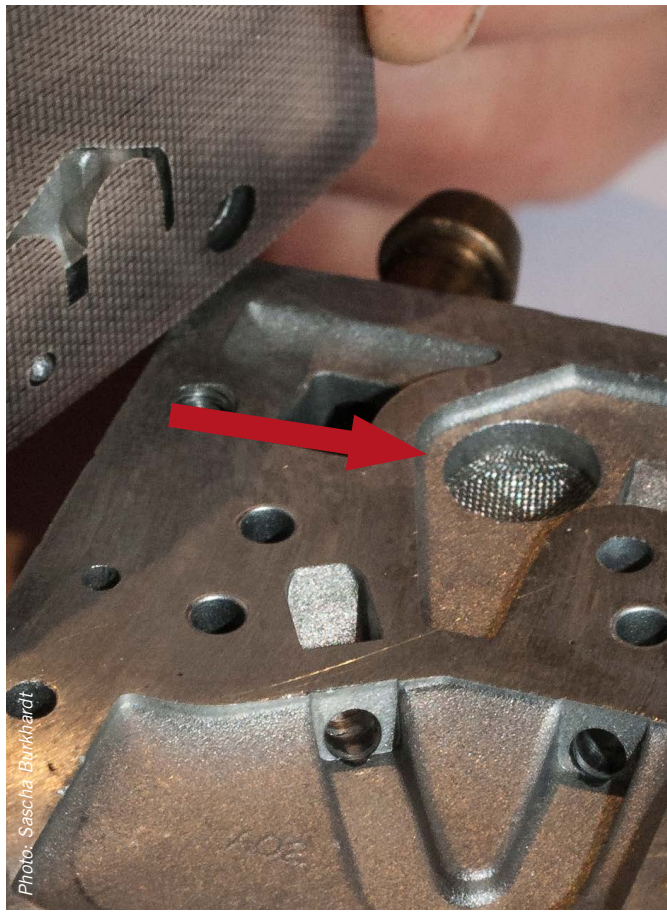
Very practical in case of a tree landing: A cord like this one, 82 g including a little lead weight at the end, 30 m long, price 8.90 euros,
www.free-spee.com
It allows you to hoist a real climbing rope into the tree when the rescue team arrives…



ON A PARAMOTOR

When you land out in an unknown place on a paramotor, you have 20 kg extra to carry on your back. This weight requires a good flare, if possible. In addition, paramotorists generally fly at a time of day when there is not much wind. And as it isn't always easy to build a nice approach at the last minute, there is a risk that the touch down will be a bit hard.

Therefore it is even more important than on a paraglider to land standing up. A tip to soften the landing and to finish the flight off nicely: Put one leg forward and one back. When the first one touches down, the second one will swing forward and naturally force you to run. Additionally, on a paramotor, it is important to choose your landing out options taking account of the possible options for relaunching. Numerous little breakdowns, like the spark plug cap coming off or some dirt blocking the carburettor, can be repaired on the spot in a few minutes. It's infuriating to have to walk for several kilometres to get to a take off site when it was within gliding distance when the breakdown occurred…



Often the reason for a breakdown and landing out: The little round filter in a membrane carburettor. Taking it apart and cleaning it are perfectly possible in a field after landing out.

Some pilots take this filter off to avoid it getting blocked, but obviously, they are just moving the problem to the fine tubes inside. Once these are blocked, cleaning them is very difficult.

Landing out in a cereal field. Relaunching from the same place seems hardly feasible…
Photo: Francis Cormon

Photo: Véronique Burkhardt/Pilot: Sascha Burkhardt

Skim the water, but only near the edge and with other people watching. After a head first fall, you can drown in ten centimetres of water…

WATER LANDINGS ON PARAGLIDERS AND PARAMOTORS

Water seems welcoming; it's true that it softens landings at any reasonable speed relatively well, but the dangers are often underestimated.

If there is nobody with a boat to get you out of the middle of the lake, there is a real risk of drowning. This is particularly the case for paramotors; even if the engine can float briefly thanks to the air in the reservoir, at some point it will sink…and you with it. Several paramotor pilots have drowned over the last few years. Just last year there was a fatality: Whilst taking photos of a friend in a kayak, a paramotorist got too close to the water.

After landing in the water, he was able to walk for a few metres in the shallow water, but the current finally pulled him under a tree. Despite his friend's assistance, it wasn't possible to save him.

Flying at low altitude over moving or running water, be it a river or the edge of the sea (even if the waves seem small), is therefore totally out of the question, on a paraglider or on a paramotor.

For water skimming on a paramotor, choose a place where the water is only a few centimetres deep. To fly over big stretches of water, a life jacket specially designed for the paramotor can reduce the risks.

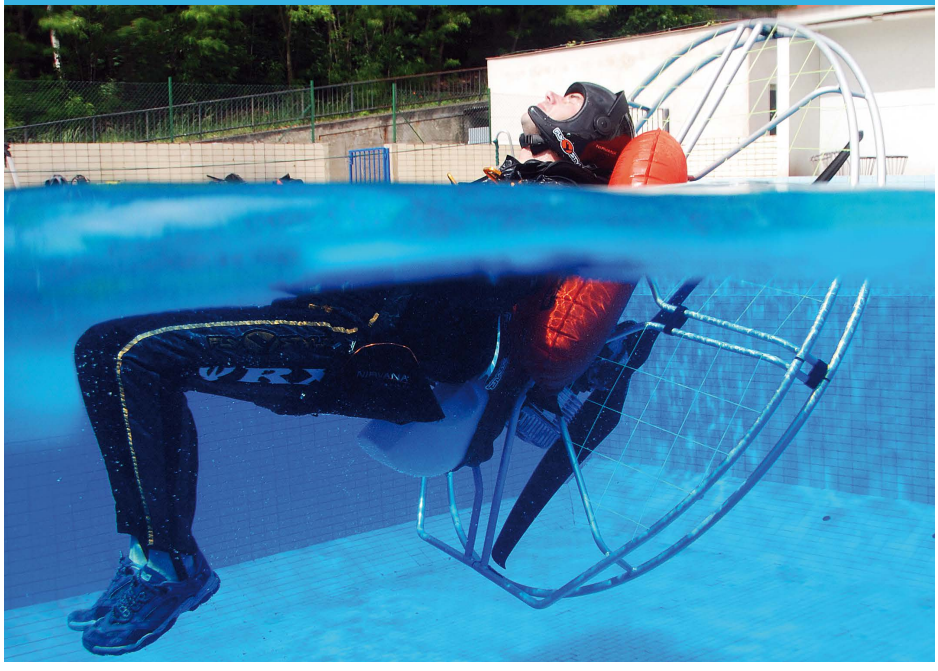
For paragliders, a normal automatic life jacket (for example, 80 euros from www.accastillagediffusion.com) would suffice, it the pilot flies regularly over a lake.

Don't forget that the foam in the harness can also force the pilot into a head down position and then, once the airbags fill up with water, the harness will weigh twenty or thirty kilos. ■

Photo: www.detektteiengel.at

Fortunately for this pilot, there were people watching and a boat at the ready…

Flystyle's Agama system (195 euros, www.nirvana.cz/agama-en/),inflates when it comes into contact with water thanks to a water-soluble plug. Several deployments in real situations have proved its effectiveness.




free.aero
WORLDWIDE PARAGLIDING AND PARAMOTORING MAGAZINE. FOR FREE.
ALL ABOUT FLYING.
ANY TIME.
ANY PLACE.
ALL FOR FREE.
THE WORLDWIDE ALL DIGITAL
PARAGLIDING AND PARAMOTORING MAGAZINE.