

Snow Kite Risk Management and Key Skills

Conditions and Sites

- I first learned water kiting in the Columbia Gorge. My instructor taught me a couple key principles to begin with:
 1. This is not windsurfing or sailing. This is aviation. You are attaching yourself to a flying machine.
 2. Accordingly, treat it like you would an airplane. Go through your preflight checklists. Do not fly in conditions you would not fly a Super Cub or an ultralight aircraft in! Strong turbulence, updrafts, squall lines, thunderstorms, hurricanes, offshore winds, dangerous ground conditions, or high gust-to-lull ratios are NOT conditions to kite in; go do something else on those days!
- People can get killed or seriously injured if they are careless with kites. The “kite-mare” videos on You Tube are people who have violated the risk management rules. Kite intelligently; take all the precautions you can. There is enough risk from mistakes even the most careful riders will inevitably make. Don’t end up on You Tube!
- You want 100 meters, a football field’s length, of downwind space that is clear of anything that might hurt you, or anything you might hurt, especially when launching, landing, or practicing maneuvers.
- On water, offshore winds are potentially dangerous. On snow, downwind hazards include trees, cliffs, cornices, dropoffs, crevasses, gullies, avalanche slopes, roads, open water, thin ice, and other things you want to avoid. Consider kiting upwind of them as kiting in “offshore” conditions, and avoid it.
- On snow, check your location for obstacles that will produce turbulence, and for such hazards as overflow water and thin ice on lakes, icy patches, rotten snow, breakable crust, sastrugi (rough, corrugated snow surface), crevasses, trees, bushes, rocks, bare spots, gullies, power lines, fences, posts, signs, people, dogs, children, or vehicles.
- Helmets are mandatory. Don’t even think of kiting without one.
- In cold water like we have in Alaska, a good wet or dry suit with hood, thick zipperless booties, and warm gloves or lobster mitts keeps you not only comfortable, but alive. Don’t skimp; be sure you are warm enough for a long body drag or swim to shore.

Resources

- Real Kiteboarding’s instructional DVD series is the best. *Zero to Hero* and *Evolution* are the first two. The first one is not quite as good as the others, but from *Evolution* on, they are great. *Joyride* and *Surf* cover jumping, performance riding, and wave-riding skills. Available online for \$29.99 each plus shipping here <http://www.realwatersports.com/gear/kiteboarding/dvd/>
- The Alaska Avalanche Specialists/Alaska Windjammer Kite Shop website is <http://www.akavalanches.com/> and our avalanche and kite course handouts and resources page is http://web.me.com/snownerd/AAS_Avalanche_Course_Materials_Site/Course_Materials_Page.html

Kite Care

- You can destroy a kite by crashing it fully powered into the ground. This applies to trainers, larger foil kites, and tube kites. You will burst the seams or pop the bladders. The repairs can be costly. So when you are about to crash the kite, either steer it back up toward the sky, sheet out, run rapidly downwind, or let go of the bar!
- Don't set up, launch, or land in or close upwind of sharp things. Kites will unpredictably fade downwind and drop into things that will pierce and tear them.
- Take care rolling and stowing the kite. Be sure bridles are not tangled, and the kite is as clean as possible. When doing a messy job due to strong wind, unfold and redo it as soon as you get indoors.
- Dry the kite! If you cannot get it dry in the field, spread it out to dry at home. Wet kites can mildew.

Launching, Landing, and Lines

- It happens that all my friends who have been hurt kiting have been hurt while launching their kites. A small error or a fouled line on launch can put the kite into the power zone and lift or drag you very quickly. Double check everything before launch, and be at your most alert. Rehearse your "what if" moves just before you launch so you are primed for action.
- RED IS LEFT! Before launching and after every time you let go of the bar, whether in a crash or to un-twist the lines, glance down and be sure you have the red side of the bar in your left hand. There is no surer way to unintentionally fly the kite into the power zone or crash it hard enough to destroy it than to have the control bar reversed!
- Kite lines are dangerous. Kites can fade downwind and drop suddenly in a lull or downdraft. The lines can wrap and lift someone when the kite re-powers, and they can easily cut flesh. Stay upwind and clear of the lines! Do not ever wrap them around your hand or fingers when they are attached to a kite and there is any wind. Be sure your kite is secured prior to launch and after landing, and be sure any bystanders watch from well upwind.
- Before you launch, be sure you have a workable plan to secure your kite when you land it!
- Tube kites are launched at the edge of the wind window. When helping to launch kites, stand at the edge of the window. Be sure the pilot has everything ready and has given you a thumbs up before standing the kite up and preparing to launch it. As you stand the kite up, be sure all the lines lead cleanly from the kite and are not caught on a tube or attachment point, and that they are not crossed.
- If the kite you are about to launch is strongly powered, move a little upwind until it is ready to take off gently. If it is underpowered, move a little downwind. Confirm that the pilot is ready before releasing it. Wait until it feels like it wants to rise before you let it go. Point the leading edge slightly toward the sky, but do not let it lay back to where it will take off too fast and fly straight into the power zone.
- A hand patted on the head is the signal for requesting assistance in landing. Repeat the signal back to answer that you will help. Do not ask people who do not know what they are doing launch or land your kite; they may endanger you and themselves!
- When catching someone's kite on landing, watch the kite. Stay just outside of and a little upwind of the kite. When it comes low enough, dash in without hesitation and grab it by the leading edge.

- Tube kites are best landed by having someone catch them. If you are alone, the surest way to land them is to use the chicken loop release. You can also land by flying them carefully into the eddy behind an obstacle so they land with the leading edge upwind, but you have to make sure they will not relaunch before you can get to them. It is best to quickly walk downwind as you pull one outside line to rotate the kite into the parked position, before unhooking.
- Carry tube kites upside down by the leading edge tube, allowing them to flag out in the breeze.
- To park tube kites, flip them over so the leading edge is down and the closed end of their horseshoe-shaped footprint is upwind. A little snow, gear, or sand for weight is usually enough to keep them from relaunching or sliding.
- We use a straight-downwind “hot launch” for foil kites if we already have skis or snowboards on, and for trainers. Be sure to first set the trim to depower, and sheet out as the kite takes off.
- We usually land foils using the brake strap or leash.
- We may use an assisted launch and landing at the edge of the window for foils when the wind is strong.
- For short breaks, land foil kites with the brake strap. Hold the strap or drive both skis or your snowboard into the snow on the kite side of the brake strap to hold it. You can also anchor to a carabiner on a loop of webbing or rope on a tree, or a loop and ‘biner from a snow picket, or from an ice screw for lakes with thin or loose snowcover. A braked kite can still flip over and pull quite hard, especially in gusty wind, so be sure any anchor is secure before you unhook.
- If you are going to leave foil kites, secure them further by laying them out flat, trailing edge upwind, and weighting the trailing edge with snow. Don’t get snow in the leading edge openings!
- To land a foil kite when it is very windy or turbulent, pull the brake strap. The power will increase for a moment before the kite stalls and turns inside out. Don’t panic; keep a steady pull until the kite lands! Then pull in hand over hand on one of those brake lines to flag the kite out so it cannot relaunch. Carefully go down that line to the kite, kneel on it, roll it from the end, and stow away.
- The kite takes you where you point it. Except for trainers, don’t stand around with your kite pointing straight up, at twelve o’clock. Any gust or updraft will lift you. Land the kite, point it toward soft things, or point it in the direction you want to go. Reserve the twelve o’clock position for stopping, getting up, and for intentional jumps. You’ll see lots of kites breaking this rule, but don’t follow their example; they are being idiots!

Launching and Post-Launch Checklist

- Kite set up so it will not blow away before you are ready. For foils, kite upside down, trailing edge upwind and weighted. For tubes, kite in horseshoe position with leading edge down, bridles down, closed side upwind, open downwind, and weighted as necessary.
- On tube kites, be sure pressure is adequate and struts’ air tube clips are shut so you will not lose all air in a puncture. Pressure for Ozone kites is 8 psi (55 Kilopascals, or 0.55 bars), but most air pump gages are inaccurate. The kite should be hard to pump and a finger flicked against the leading edge should make the high-pitched ringing sound as demonstrated in the field.

- Bridles checked and clear, no tangles or hangups, no weak or worn spots..
- Lines combed and clear. In good shape. Double-check from both ends to be sure they are run clear all the way, especially with tube kites. Red to red and blue to blue. This step is critical to your risk management, so check it again!!
- Red on left before launch. Red will be on left already when setting up foils; should need to be flipped only when setting up tube kites with lines running downwind from kite.
- Trim set for minimum power; clamcleat line pulled in all the way on Ozones.
- Bar sheeted out.
- Release mechanism checked and cleared as needed.
- First clip in leash, then hook in. Check to be sure chicken finger is set so it has no pressure that might push it out of position.
- Check that kite is in ready position. For tube kites or for foils in strong wind, that is downwind enough of you to fly but not to have too much power; still at edge of window.
- Final hazard check - people, animals, site issues, traffic, turbulence, gusts, or other approaching nasty weather. Review quick release motion to prime brain for quick response if needed.
- For assisted launch, signal helper to raise kite. Check lines from your end, ask helper to confirm that they are clear on their end.
- Review motion for quick release so you are primed in case anything goes wrong. Double check red on left, trimmed for minimum power, sheeted out.
- For assisted launch, give thumbs-up to helper and gently steer the kite up.
- Check to be sure lines are clear before the kite gets very high. Land it right away or hit the quick release if you suspect anything is wrong. Be sure the kite sheets and steers properly, trim is still depowered, and chicken loop is seated properly.

Speed Control

- When a gust hits while you are riding, sheet out and edge hard, using the power to point upwind. The kite will move toward the front edge of the window and depower. For most gusts, this is enough.
- Occasionally, you will be hit by a series of gusts that still cause wild acceleration and the feeling that you are totally losing control. Don't panic; if you do you WILL lose control! Instead, settle your stance while still stood-up and sheeted out, then set your edge(s) HARD like you are trying to stop. You're not actually trying to stop with your edges; you are trying to move the kite to the edge of the window and dump power. This move is remarkably effective, usually taking you from the edge of losing it back to kiting comfortably, but you must do it decisively.
- You can also just head downwind. Not just a little, which will cause more acceleration, but enough to slack the lines. Or you can jump, which also dumps kite power, if it's not too turbulent. Neither of these moves are more than temporary fixes, but they help in big gusts.
- Remember, you can always stop by edging hard and steering the kite slowly but steadily up to twelve o'clock, and you can hit the quick release if it is still too powered.
- If you keep having to dump power, it is time to grab a smaller kite!

- To land an overpowered kite, use the brake strap as usual but be prepared for a momentary increase in power that may lift you a little before the kite stalls and loses power.

Emergency Sequences

- Always be ready to hit the release if needed when launching or landing. Mentally rehearse the motion and move your hand to prime your brain and muscle memory for quick response.
- The first remedy when something goes wrong while without skis or board is to sheet out and run down wind. This will slack the lines and move the kite to the edge of the window. But don't rely on this; have your hand already in place, ready to initiate the second step.
- The second step with a foil kite is to hit the brake strap to flag and land the kite. Power will increase for a moment before it drops, so pull hard and don't let up. If for some reason that does not work, releasing the chicken loop is another way to do the same thing.
- The second step with a tube kite is to hit the chicken loop quick release to flag and land.
- If the kite is somehow bow-tied and powered up and you are about to be seriously hurt, the next and final step with any kite is to hit the quick release on the leash and ditch the kite. Don't do this lightly; you lose the kite and it will attack anyone who is downwind. But if the alternative is death or injury, get rid of the kite!

Traffic and Right of Way

- Starboard tack (right hand forward) has right of way. But many do not know this, so ride to avoid collision regardless.
- Downwind kiter has right of way; but similarly, don't force the kiter upwind of you to pinch so hard upwind that they lose way.
- Overtaking kiter avoids slower kiter.
- Jumping kites yield to those not jumping, but don't hold so strongly to this that you get landed on or hit!
- Upwind kiter keeps kite high; downwind kiter keeps kite low.
- Stay aware of where other nearby kites are, especially those behind (upwind of) you.
- Look first before you change tacks with a transition!
- Clear crowded landing and launch areas quickly.
- Always be thoughtful about preserving kiting's good reputation. Do not interfere with other peoples' enjoyment of places we share, hog all the space, or endanger others. Be friendly and answer questions when you can.

Resources

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- The Alaska Avalanche Specialists/Alaska Windjammer Kite Shop website is <http://www.akavalanches.com/> and our avalanche and kite course handouts and resources page is http://web.me.com/snownerd/AAS_Avalanche_Course_Materials_Site/Course_Materials_Page.html

Pre-class Preparation

The best thing you can do to prepare for kiting lessons is to buy or borrow a foil trainer kite and put in as much practice time as you can with it beforehand. It will take at least three or four hours to dial in the basic skills, preferably in several sessions so you practice in a variety of conditions.

The more practice time you put in before your lessons, the stronger your kite skills will be and the more benefit you will get out of the lessons. You want to practice your basic kite handling skills into muscle memory, so you don't have to think about them. Work systematically through the trainer kite exercises in the key skills list below.

Trainers with a three or four-line flag-out release system are strongly recommended; if you can only get a two-line kite just be sure it is 2m or less and don't fly it in strong winds.

Key Skills

- Risk management
- Etiquette
- Gear care
- Practical kite theory
- Foil trainers
 - Foil kite setup and packing.
 - Risk management and gear care review.
 - Foil trainer exercises: short turns to get the feel of the kite, launching/landing, exploring the edge of the window, move slow/move fast, untwisting the lines, stop at each "hour", power strokes: shallow "kitty sips" at edge of window, longer strokes deep in window; relaunching; lulls and gusts, walking while flying the kite.
- Tube trainers
 - Tube kite setup, preflight, launching/landing, and packing.
 - Tube trainer exercises: tube kite feel, using harness and chicken loop, relaunching, generating more power.
- Small and full size kites
 - Kite sizing.
 - Control and multiple release systems.
 - Launching with skis/snowboards.
 - Launching and landing; anchoring; relaunching.
 - Stopping, turning (ski turns and snowboard sliding transition), and speed control.
 - What to do when kite lifts or drags you.
 - What to do when overpowered.
 - Getting up when you fall with kite attached.
 - Dealing with lulls and gusts.
 - Powered ski turns; heelside and toeside snowboard turns.
 - Jumping
 - Hills
 - Landing, depowering, and stowing kites in strong winds.

- Up and downwind touring; travel techniques.