

2002 U.S. Paragliding Accident Summary
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USHGA received 72 reports of paragliding incidents and accidents in 2002, a slight decrease from 2001. 26 of the reports (36%) were about incidents. **Incidents** are broadly defined as any outcome of a flight that was not intended by the pilot but did not result in an injury. 46 of the reports (64%) were for **accidents**, which are defined as any incident resulting in an injury to the passenger or pilot.

Fatalities

Regrettably, 2002 was marked by a dramatic increase in the number of paragliding fatalities in the U.S. After zero fatalities in 2001 and only two fatalities from 1999-2000, there were seven fatal paragliding accidents in 2002 (10% of reported accidents).

There does not appear to be any single factor to explain the increased number of fatalities. The pilots were diverse in terms of rating, number of flights, years of experience, and rating of wing. Two accidents occurred on launch, three while in flight, one on landing, and one while towing. Only one of the pilots who was killed attempted to deploy his reserve, but was too low for successful deployment.

Witnesses of three fatalities reported the pilots were flying with excess brake close to the ground and were unable to recover from stalls, spins, or turbulence-induced deflations. Unfortunately, three of the fatal accidents were unwitnessed. These pilots encountered in-flight conditions that resulted in sudden impact with the ground without attempt to deploy their reserves. Investigations of these three accidents did not reveal any apparent equipment failures and hypothesized that spin or stall while flying close to the ground was the most likely cause.

When flying below safe reserve deployment height, our margin of safety is dramatically reduced. Many pilots fly slowly to try and improve the sink rate performance of their gliders. However, flying at slower than trim speed increases the risk of inadvertent stall or spin when turning or encountering turbulence. If there is sufficient altitude to recover or deploy the reserve, this negligible gain in performance may be worth the relatively large gain in risk. However, when flying low, the safest approach is to fly fast, utilize weight shift when turning, and avoid excessive brake pressure to keep the largest possible margin of safety.

The towing accident appears to have been a non-USHGA trained pilot and it is not known if proper towing safety equipment was used. The pilot reportedly crashed into a tree without injury, then released himself from the harness and fell to his death instead of awaiting rescue.

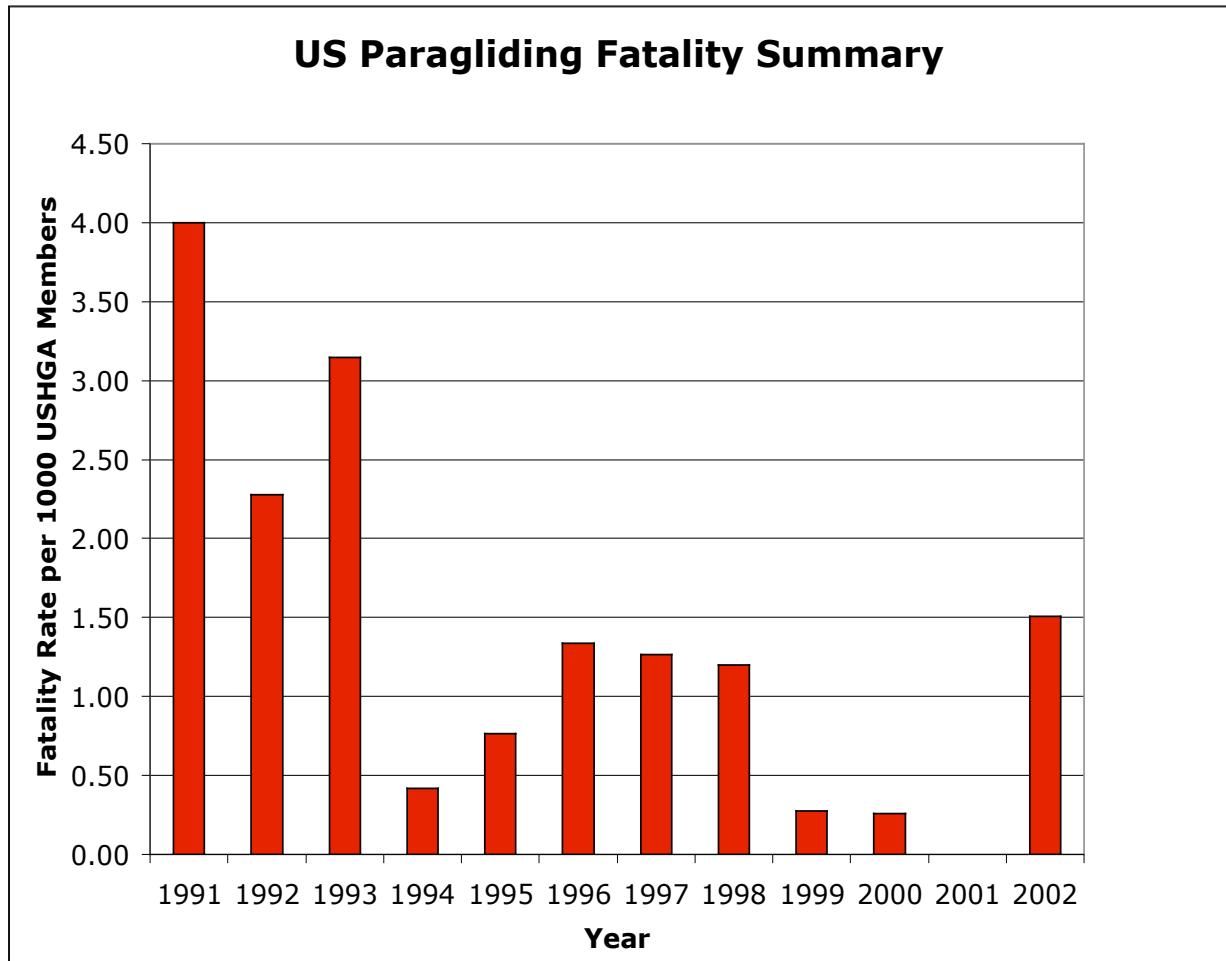
Pilot age may also be a factor. The average age of the pilots who died in the U.S. in 2002 was 52 (range 34-71). As Pete Reagan has pointed out in his accident analysis columns,

age may affect dexterity. It also affects a person's ability to recover from major trauma. Pilots who are older may wish to incorporate this in their decision-making.

Although this is the largest total number of paragliding deaths in the U.S. since the birth of the sport, the rate of fatal accidents per 1,000 USHGA members has actually declined since 1991, and been relatively stable since 1994. The table below shows the number of fatalities per year and the number of USHGA paraglider pilots. The average number of fatalities per 1,000 USHGA members from 1991-2002 is 1.37. The years 1991-1993 had a much higher number of fatalities than this average. It is reasonable to exclude these three years since they represent the birth of the sport with equipment and training that was not as good as is currently available in the U.S. From 1994-2002 the average fatality rate per 1,000 USHGA members was 0.78.

<u>Year</u>	<u># of Deaths</u>	<u># of USHGA Paraglider Pilots</u>	<u>Fatality Rate per 1000 USHGA Members</u>
1991	4	1000	4.00
1992	3	1316	2.28
1993	6	1908	3.14
1994	1	2388	0.42
1995	2	2624	0.76
1996	4	2991	1.34
1997	4	3167	1.26
1998	4	3337	1.20
1999	1	3650	0.27
2000	1	3843	0.26
2001	0	4267	0.00
2002	7	4640	1.51

This data is summarized in the graph below. Although the 2002 fatality rate is higher than the average, it is within the range of what is statistically probable.



Often times, it is luck – good or bad – that distinguishes an injury accident from a fatality. From 1999-2001 we had several accidents that resulted in serious injuries and could easily have been fatalities. Unfortunately, in 2002 our luck was not as good. We should not be complacent in our efforts to reduce the number of accidents that result in either fatality or serious injury.

Phase of Flight

Phase	2002	2001	2000	1999	1998
Kiting	--	1%	2%	8%	6%
Launching	21% (15)	32%	20%	27%	23%
In-Flight	49% (35)	29%	52%	27%	26%
Aerobatics	6% (4)	1%	--	--	--
Landing	28% (20)	38%	25%	39%	45%
Tow	1 (1%)	--	--	--	--

The table above summarizes the phase of flight in which accidents occurred. The number in parenthesis is the total number of accidents reported for that category. **Kiting** means the pilot is clipped in but did not intend to leave the ground. **Launching** accidents include the **takeoff** phase (set up, building wall, kiting, and launching) and **departure** (from leaving the ground until established in flight). **Landing** accidents include problems during **approach**, or problems occurring in the actual **LZ**. Accidents are attributed to **aerobatics** if the pilot is performing the maneuvers intentionally.

After a decrease in the number of in-flight accidents in 2001, the percentage of accidents occurring in-flight increased to 49% in 2002. Most in-flight accidents were attributed to asymmetric deflations (14%), negative spins (14%) or stall (25%) occurring too close to the ground to allow for a safe recovery.

Of the 21% of accidents occurring on launch or departure, the most common factors cited are strong wind or thermal turbulence (73%), a poorly inflated takeoff (50%), or cross-wind (33%). Landing accidents account for 28% of accidents, and are again evenly divided between those occurring due to a problem during approach and those occurring in the intended LZ.

There were a total of four accidents reported in 2002 that resulted from intentional **aerobatics** over the ground. Three of these resulted in serious injuries. One reportedly involved alcohol. One pilot reported that his reserve failed to deploy properly due to a high rate of rotation and low altitude. This pilot attributed his injuries to failure of his reserve to deploy rather than his low altitude or high risk maneuvers over the ground. There have been two fatalities attributed to aerobatics in the U.S. in previous years.

There were two accidents reported in 2002 that involved assisted launches. In one dramatic accident, an assistant was unable to release his grip from the harness and was lifted more than 500 feet in the air. The pilot and his unintended passenger crash-landed into a tree and the assistant fell more than 100 feet from the tree to the ground. Miraculously both pilot and assistant survived with minor injuries. Assisted launches have resulted in several serious accidents in previous years. The risks involved may not be obvious to either the pilot or the assistant.

Nature and Severity of Injuries

Here is the breakdown of injuries for the past several years:

Nature of Injury	2002		2001		2000		1999		1998	
	Qty	%	Qty	%	Qty	%	Qty	%	Qty	%
Head	3	4%	0	0	--	--	--	--	--	--
Face	2	3%	0	0	--	--	--	--	--	--
Neck	4	6%	1	1%	--	--	--	--	--	--
Back	15	21%	20	25%	12	38%	12	29%	5	23%
Chest	9	13%	3	4%	--	--	--	--	--	--

Abdomen	3	4%	3	4%	--	--	--	--	--	--
Pelvis	6	8%	0	0	4	13%	3	7%	3	14%
Arm	7	10%	11	14%	2	6%	3	7%	5	23%
Leg	20	28%	27	34%	--	--	--	--	--	--

Severity of Injuries	2002		2001	
	Qty	%	Qty	%
Fracture	30	65%	33	65%
Sprain	12	26%	10	20%
Laceration	1	2%	3	6%
Bruise	8	17%	11	22%
Unknown	2	4%	4	8%
Dislocation	4	9%	3	6%
Internal	9	20%	--	--

There were a total of 46 injury accidents reported. 34 pilots (47%) sought care in the emergency department or from their physicians, and 26 accidents resulted in overnight stays in the hospital (36%). Since many pilots do not report accidents that result in minor injuries, we believe the accident statistics overestimate the probability of serious injuries.

Of the seven fatal accidents reported, five victims were pronounced dead on the scene. The two who were transported to the hospital both sustained major head injuries and died later from their injuries. One fatality resulted from a fractured neck, two from severed aortas and internal injuries, and three from head injuries. The nature of injuries in the towing fatality is unknown.

Paragliding accidents continue to result in an unacceptably high number of severe **back injuries**. Eleven of the 19 back and neck injuries reported in 2002 resulted in fractures (57%). This is similar to the 60% reported last year. One fatal accident was attributed to a fractured neck. Some reports indicate that soft foam back protectors prevented “certain injury”. Several pilots reported they intentionally landed on their back protectors instead of doing a Parachute Landing Fall (PLF). While there is good evidence that a proper foam back protector can reduce injuries, it is not intended to replace the PLF. Correct PLF technique has been repeatedly shown to reduce the frequency and severity of injuries to sport and military skydivers. Paraglider pilots should practice PLF landings and be prepared to do one on every landing.

Leg injuries were the second most common type of injury. Seven of the 20 leg injuries reported (35%) were fractures.

Qualifications of Injured Pilots:

Rating	2002				2001	2000	1999
	# incidents reported	% of total reports	# active USHGA members with rating	Accident rate (# incidents per 100 pilots)	% of total reports	% of total reports	% of total reports
Student/None	3	4%	N/a	--	6%	16%	6%
P1	6	8%	557	1.07	11%	9%	17%
P2	16	22%	1978	0.81	36%	25%	29%
P3	15	21%	1129	1.32	18%	23%	11%
P4	22	31%	873	2.52	15%	23%	11%
P5	1	1%	31	3.22	3%	7%	3%
T3	3	4%	231	1.29	5%	--	--
Unknown	7	10%	N/a	--	1%	--	--

Unfortunately, we have very little reliable denominator data on which to base calculations of accident rates. Ideally, we would be able to calculate the number of accidents per 1,000 flights, or the number of accidents per flight hour. One denominator that is available is the number of active USHGA members holding each rating. Last year, the rates for P2-P4 pilots were nearly equal. This year there was a trend towards more frequent accident in P4 and P5 pilots, which was not statistically significant.

Wing Rating:

For the reports that included information about the wing, here are the DHV ratings for those wings:

Wing DHV Rating	#	%
1	12	17%
1-2	18	25%
2	23	32%
2-3	7	17%
other	8	11%

49% of accidents occurred on DHV 2 or 2-3 wings in 2002, which is slightly higher than 2001.

Factors:

The table below summarizes the most commonly reported factors. The percentages reported are from the 72 total reports received. Most accidents have several contributing factors so the percentages below add up to more than 100%.

<u>Contributing Factors 2002</u>	<u>Count</u>	<u>Pct.</u>
Too close to Ground	15	21%
Outside LZ	13	18%
Strong Wind	11	15%
Thermal Turbulence	10	14%
Rotor	10	14%
Stall	9	13%
Poorly Inflated Takeoff	7	10%
Other	7	10%
Mid-Air Collision	6	8%
Under Instruction	6	8%
Turning into Ridge	6	8%
Tail Wind LZ	5	7%
Turning in LZ	5	7%
Asymmetric Deflation	5	7%
Negative Spin	5	7%
Crowded Airspace	5	7%
Cross Wind Launch	5	7%
Lack of pilot Currency	5	7%
Panic	4	6%
Hill Collision	4	6%
Spiral Dive	4	6%
Aerobatics	4	6%
New Equipment	4	6%
Obstacle in LZ	3	4%
Excessive Brake Flare	2	3%
Fatigue	2	3%
Power Lines	2	3%
Blown back	2	3%
Reserve Not used/too late	2	3%
Cloud Suck	1	1%
Flying in Cloud	1	1%
Water landing	1	1%
Dragged by wind	1	1%
Failure to attach chest/leg straps	1	1%
Alcohol/Drugs	1	1%
Tow Accident	1	1%

The most common contributing factor in 2002 was flying too close to the ground or obstacles. In most of these accidents strong wind, thermal turbulence and rotor turbulence resulted in the pilot not having an adequate safety margin to recover.

There were only two incidents reported in 2002 involving power lines. This is a gratifying decrease from the seven incidents reported in 2001. Power lines remain a significant hazard at many of our flying sites.

There were a total of three midair collisions reported in 2002. Luckily, none of these resulted in major injuries. One collision between a tandem and a solo paraglider is described below. Another collision was between a paraglider and hang glider and the third incident involved two solo paragliders who successfully deployed reserves.

One incident was reported due to inadvertent routing of a speed bar line through the reserve handle. When the pilot applied the speed bar on approach to the LZ, the reserve was unintentionally deployed.

There were nine intentional reserve deployments in 2002. Two reserves did not open completely, either because the pilot was too low or rotating rapidly resulting in the reserve being entangled in the paraglider lines. Seven reserves deployed successfully including one by a tandem pilot. Seven pilots and the tandem passenger were uninjured or had only minor injuries. One pilot fractured his back after a successful deployment. One of the pilots who was killed attempted to deploy his reserve but was too low.

Tandem Incidents:

There were four reported tandem incidents in 2002. Three resulted in no injuries to the pilot or student. One accident resulted in fractures to both the instructor and student.

One tandem incident involved a midair collision between a tandem and solo paraglider. The tandem pilot deployed his reserve successfully and neither pilot nor student were injured. This is believed to be the fourth successful tandem reserve deployment in the U.S. The pilot of the solo glider was P1 rated and was under instruction at the time of the accident. The pilot of the tandem glider was T1 rated.

Please continue to report your incidents and accidents!

Although we have seen a gratifying increase in the number of reports, we estimate that only about one in four incidents are reported to USHGA. Pilots may submit reports online at <http://www.ushga.org/emailacc.asp> or use paper forms available on the website or from USHGA. USHGA will give you a \$5 merchandise coupon for every accident report you submit.

This is my second year compiling the paragliding accident statistics for USHGA (JimLittle[at]mac[dot]com). I'm a P3 pilot and family physician in Portland, Oregon. Note: My email address has been modified to prevent spam... I am happy to reply to questions from pilots, just type replace the [at] and [dot] with the appropriate punctuation marks. Thanks!