


More Lives Saved: A Year Of Drone Rescues Around The World

A thermal camera view showing a car on a road and a person lying in a ditch. The car is on the right side of the road, and the person is in a ditch to the left. The image is in grayscale, highlighting the heat signatures of the car and the person.

A Lincolnshire, UK police officer rushes to help an unconscious man in a ditch, as seen from the thermal camera of the drone that found him.



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A Report Prepared By The DJI Policy & Legal Affairs Department

More Lives Saved: *A Year Of Drone Rescues Around The World*

One year after DJI first quantified the power of drone technology to save lives, drones have become an integral part of lifesaving operations around the world.

In the past year alone, media accounts from five continents have documented dozens of people saved from danger thanks to drones. Rescuers have used drones to drop buoys to struggling swimmers in Australia and Brazil; spot unconscious victims on freezing cold nights in rural England and America; and find stranded people in farm fields, along rivers and on mountain trails.

From May 2017 through April 2018, DJI has counted 65 people who were rescued from peril by use of a drone:

- At least 22 of them were in situations with great risk of death, such as stranded in a body of water or exposed in hazardous weather.
- Another 19 were found or assisted by drones in circumstances that were not imminently life-threatening, but presented great risks to health and safety.
- A single incident involved [24 tourists lost at night](#) on a mountain with no food or water. Searchers found them with a drone after three hours of effort, and needed hours more to carry them to safety. While it is unlikely that all 24 would have perished without the drone's help, some were clearly saved from potential injury or death.

This update comes a year after DJI released its [report](#) “Lives Saved: A Survey of Drones in Action,” which counted 59 lives saved by drones through early 2017. **Our updated survey of public reports brings the tally of people rescued by drones around the world to at least 124.** With public safety agencies around the world quickly adopting drones as a standard tool for search and rescue, it seems certain that this number will continue to rise.

A full list of these incidents, as well as links to contemporaneous media coverage of each, is presented in a table at the end of this report. This list was compiled from news accounts, primarily through English-language searches, and thus **the total of 65 people rescued in the last year likely undercounts the number of lifesaving drone rescues around the world.**

New Trends Emerging

With dozens more rescues documented in news accounts over the last year, it is possible to draw new conclusions about how drones are being used to save lives:

- **Thermal imaging cameras saved the lives of at least 15 victims who were hidden from view by darkness or obstacles.** In one incident in North Carolina, a missing 11-year-old girl had fallen asleep under leaves in a thicket on a 30-degree night. “It was so

dark in the woods that even with flashlights, deputies walked right past the child and had to be directed back to her by the drone pilot,” [local media reported](#). In Minnesota, a police drone pilot used a thermal imaging camera to [find an unresponsive 84-year-old man](#) in a marshy area on a night when bad weather kept a state police helicopter from flying. In the UK, a police drone unit [saved the life of a driver](#) who had wandered from his crashed car into a ditch on a sub-freezing night. The widespread adoption of thermal imaging drone cameras has allowed



Six people missing on a river at night were found with a thermal imaging camera. Image courtesy of Decorah, Iowa Fire Department.

even the smallest public safety agencies to adopt a lifesaving technology that was once available only to agencies that operate helicopters.

- In the reports we found, half the people saved by drones (32) were rescued in the United States, with the rest in China, Australia, Brazil, France, Malta and the United Kingdom. While this may reflect a sourcing bias for English-language news accounts, efforts by the U.S. Federal Aviation Administration (FAA) to open up the skies to rescuers may be a contributing factor as well. The “Part 107” set of basic professional drone rules, launched in 2016, gave drone pilots a clear, reasonable path to be certified to fly drones for professional purposes, and has greatly increased the number of public safety agencies using drones. **Drones cannot be used widely for lifesaving work unless laws and regulations allow and encourage it.**
- The rescues documented over the last year occurred in 27 separate incidents, up from 18 incidents in the previous four years. News stories indicate that public safety agencies which acquire drones often use them on repeated missions over several months before they are credited with a rescue. In these agencies, **deploying a drone has become a standard part of public safety operations**, increasing the likelihood they will be able to find a missing person or otherwise help protect life and property.
- Professional rescuers continue to use the payload capacities of drones, not just their visual and thermal observation capabilities. **In the past year, rescuers used drones to deliver [flotation devices](#), a [note](#), a [two-way radio](#), and [beef jerky and cookies](#)** to assist stranded individuals before rescuers reached them.

Lives Protected: Keeping Rescuers From Harm on Dangerous Missions

The use of drones by public safety officials has helped more than just civilians in peril. Over the last year, police officers and firefighters used drones to protect themselves during at least three incidents that posed potentially deadly threats.

In a rural section of Ontario, Canada, last winter, a snowmobiler traversing a lake during a heavy storm fell through the ice more than a kilometer offshore. The Renfrew County paramedic service flew a drone to the scene and discovered the snowmobiler had vanished under the ice.

Paramedics had been prepared to risk their own lives on a rescue mission, but the drone made clear it was now a recovery mission that could wait for safer weather. **“I strongly believe we prevented further injury or death of a first responder,”** [the head of the paramedic service said](#).

In at least two other cases, police agencies used drones to remotely monitor volatile confrontations with armed individuals, providing officers a way to assess dangerous situations without risking their own lives. In the aftermath of a November mass shooting at a church in Sutherland Springs, Texas, [video taken by a bystander](#) shows a small drone hovering over the suspect’s crashed vehicle as police took cover nearby. Authorities apparently used the drone’s live video feed to determine the suspect had taken his own life. In February, a distraught woman waved a pistol at police officers in a Virginia parking lot and shouted, “Just kill me!” The sheriff’s office [flew two drones over the scene instead](#), providing real-time awareness as deputies rescued a nearby bystander and then waited for the ideal moment for a surprise de-escalation and arrest of the woman.



Police used a drone to find this 81-year-old woman with dementia in a field near her home. Image courtesy of Randolph County, North Carolina Sheriff’s Office.

Beyond those life-threatening moments, the stories of other incidents make clear that drones have profoundly improved search and rescue activities by allowing them to proceed faster, safer and more easily. Traditional search and rescue operations require rescuers to comb difficult terrain such as swamps, cliffs and underbrush no matter how forbidding the weather. Those activities present obvious risks to rescuers, while also straining the operational capacities and budgets of public safety agencies. When drones are able to find missing people or otherwise resolve emergency situations faster than before, the rescuers benefit as well as the rescued.

The Role Of Better Technology and Regulation

Public safety agencies that use drones in rescue missions benefit from two important trends in the drone industry: Rapid technological innovation and improved regulatory requirements.

Manufacturers and developers continue to create new drone hardware and software for first responders, from thermal imaging cameras to augmented-reality overlays to real-time image analysis. While some of these technologies have been developed specifically for rescue services, others were first developed and deployed in the much larger market for consumer drones. It is already well-established that a robust consumer drone industry increases the adoption of drones for professional purposes, as well as the likelihood that a civilian bystander will be in the right place at the right time to help in an emergency. Less appreciated, however, is the clear reality that **if regulatory policies limit the availability of drones to the general public, public safety agencies will be less likely to benefit** from the innovative technology, economies of scale and competitive pricing created by a healthy market for consumer drones.

Similarly, public safety agencies cannot put drones to work without a legal and regulatory environment that encourages their use. In the United States, the FAA’s “Part 107” rules established in 2016 for professional drone use have proven to be a strong model for bringing new



Drones carried life preservers to two fishermen stranded in a flooded river in Sichuan, China. Photo by Zhong Jia.

drone operators into the field while ensuring they fly safely and responsibly. However, Part 107 pilots are restricted from flying at night, over people or beyond the pilot’s line of sight unless they receive an individual waiver from the FAA. The FAA quickly authorized many such waivers in the aftermath of deadly hurricanes in 2017, but the system still forces rescuers to rely on exceptions, rather than rules, in many potentially lifesaving situations. As countries continue updating their drone regulations, policymakers must carefully consider how they affect

public safety agencies and the unusual, challenging flight patterns often required in lifesaving missions. **Regulations that put undue burdens on emergency drone use will take a toll on public safety.**

Providing Closure: Drones in Water Recovery Missions

Not all search and rescue missions end happily. In cases where victims cannot be rescued, public safety agencies increasingly use drones to find their remains. Several notable examples of this important task have emerged in water recovery missions, as drones were able to locate bodies that could not be seen or identified from shore. Drone technology allowed authorities to provide answers and closure to the distressed families of the missing, while reducing the likelihood that searchers would be injured or placed in peril during extended search efforts.

Near Pittsburgh in November, authorities spotted a woman’s body trapped in a roiling current near a dam. It was too dangerous for rescuers to approach, but the Allegheny County police flew a drone close enough to [photograph a distinctive tattoo](#) on the woman’s arm. The body later disappeared and has not been recovered. But police matched the tattoo to a report of a missing woman, and was able to provide her family confirmation that she had died. It was the second time police there had used a drone to locate a body in the Ohio River.

A Wisconsin police department also used its drone to locate the bodies of drowning victims [twice in two months](#), including using its thermal imaging camera to find the body of an ice fisherman more than 12 hours after he had last been seen. In Florida in December, rescuers [borrowed a local resident’s drone](#) to search for a 4-year-old autistic girl who had run out of her home, and found her body in a retention pond.

Drone Lifesaving is Becoming Routine

No central register of drone rescues exists, and any attempt to monitor them strictly through news coverage will inevitably miss important incidents. Some public safety agencies do not note their use of a drone in a lifesaving operation, not all incidents rise to the notice of news reporters, and incidents which receive local coverage may not be widely disseminated – especially across political, cultural or language barriers.

Nevertheless, this report and its predecessor make clear that the pace of drone rescues is accelerating. At least 124 people have been saved from peril thanks to a drone, whether by spotting missing people, guiding rescuers along land or water, or delivering flotation devices or other supplies. The true number is likely higher, and will surely continue to grow as police and fire departments increasingly adopt drones as a routine tool for use in emergency response.

The growing use of drones to save lives raises one surprising possibility: **As drone rescues become more common, they may be less likely to make news.** Today, a missing person found by a drone is unusual enough to warrant stories on television, newspapers and social media. In a few years, a successful drone rescue will no longer be a novelty, and these incidents may no longer receive wide media attention. **The number of lives saved by drones may well grow to a level where they become, in a practical sense, uncountable.**



Two lost hikers wave to the drone that found them on a Colorado mountainside. Image courtesy of Douglas County Search and Rescue Team.



Date	Country	Description	People rescued	Media coverage
5/6/17	USA	Drone brings food to stranded hunters	2	Link
5/27/17	USA	Missing man found in desert	1	Link
6/11/17	USA	Drone finds two stranded tubers	2	Link
6/15/17	USA	Drone finds lost hikers on mountain	2	Link
6/26/17	USA	Drone finds four tubers at night	4	Link
7/18/17	China	Drone brings life vests to stranded fishermen	2	Link
7/21/17	USA	Missing woman found on riverbank	1	Link
8/15/17	USA	Drone guides rescuers to injured logger	1	Link
8/20/17	USA	Drone finds more tubers lost on river	6	Link
9/14/17	USA	Missing woman found in dark field	1	Link
9/19/17	USA	Drone finds missing special needs boy	1	Link
10/3/17	China	Drone finds 24 stranded hikers	24	Link
10/10/17	USA	Missing person found with drone	1	Link
11/2/17	USA	Three runaway children found with drone	3	Link
11/4/17	USA	Drone finds 84-year-old unconscious hunter	1	Link
11/5/17	USA	Drone finds disoriented woman in field	1	Link
12/17/17	USA	Drone finds 92-year-old hunter at night	1	Link
1/18/18	Australia	Drone drops buoy to two struggling teens	2	Link
2/10/18	USA	Drone finds stranded hiker	1	Link
2/14/18	France	Missing person found by police drone	1	Link
2/24/18	Malta	Drone finds stranded hiker	1	Link
2/25/18	UK	Drone finds unconscious man in ditch	1	Link
2/25/18	Brazil	Drone drops buoy to struggling kitesurfer	1	Link
3/1/18	USA	Missing 11-year-old girl found by drone	1	Link
3/3/18	USA	Drone finds injured bicyclist	1	Link
3/13/18	China	Dehydrated woman rescued in mountains	1	Link
3/27/18	USA	Drone finds man stranded in flooded river	1	Link