



ICAR 2025 Congress
Jackson Hole, Wyoming, USA
October 8-11, 2025
MRA TERCOM Report
Tom Wood, Rich Siemer, MRA Terrestrial Rescue Delegates



Practical Day: Wednesday, 10/8/25

The 2025 ICAR Practical Day took place on the mountain above Wyoming's Teton Village. This year's ICAR host, Teton County Search and Rescue, organized the activities on the mountain for more than 400 hundred mountain rescuers in attendance. Each commission participated in the scenarios that were spread out over 12 stations, with this year's Practical Day theme being Managing Risk and Meeting Societal Needs.



Kirk Mauthner, representing Parcs Canada, demonstrates the merits of the lightweight, Shared Tension Rope System Terrestrial Rescue Commission ICAR recommendation.



Members of Wyoming's Peak Rescue demonstrated Guiding Line principles from the newly installed Via Ferrata route on the mountain.



Practical Day attendees test out the strength of a multipoint, load sharing anchor at the CMC station.



Lowering and raising with limited gear and resources at the Petzl station gave attendees the chance for some hands-on scenarios.



Members of the ICAR MedCom set up patient packaging stations that demonstrated the harm that can be done by C Collars and rigid spine boards during backcountry evacuations.

Of interest to the Terrestrial Rescue Commission, there was a lightweight rescue station run by CMC, a bolting and anchoring station hosted by Petzl, a Shared Tension Rope System station set up and run by the TerCom's Kirk Mauthner and a guiding line demonstration set up and run by Peak Rescue. Teton County SAR showcased the capabilities of their helicopter program by inserting rescuers mid-wall to pick off two stranded and injured climbers.

The MedComm had hands-on stations that preached the revolutionary notion that C Collars and rigid spine boards may do more harm than good in backcountry rescues, and stressed the importance of vacuum mattresses in patient packaging for spinal protection.

Here are the links for the two Practical Day videos by Topograph Media:

<https://vimeo.com/1132927842> and <https://vimeo.com/1140101918>.



2025 ICAR TERRESTRIAL RESCUE COMMISSION REPORT



Day 1: Thursday, 10/9/25

WORKING GROUP REPORTS

UIAA Safecom Working Group

Wildfire Work Group

- Mountain rescue groups (especially in Europe) are increasingly being activated during wildfires. This creates a need for
 - Clear tasks and responsibilities
 - Specific PPE and equipment for the environment
 - Specific training
 - Cooperation and collaboration with firefighters
- Here is the link to the approved TerComm Recommendation: <https://www.alpine-rescue.org/articles/1680--wildfire-tercom-recommendation-nr-11>

Shared Tension Rope Systems Work Group

- Reduced risk of catastrophic failure from sharp edges
- Reduced system forces
- Reduced stopping distance due to pre-load
- Here is the link to the approved TerComm Recommendation: <https://www.alpine-rescue.org/articles/14--tensioned-rope-rescue-systems-tercom-recommendation-nr-5>

DAY ONE PRESENTATIONS

As was the case at ICAR in Greece last year, the topics of AI, drone use in SAR and advances in cell phone technology dominated the Terrestrial Rescue Commission presentation schedule. For copies of each presentation, visit <https://www.alpine-rescue.org/topics/27--information-minutes>

LPB2 Updates, Robert Koester

In his landmark book, *Managing the Lost Person Incident*, Koester laid the groundwork for the way that we now approach searches. Since the book's first publication years ago, many advances have been made in search theory and the data collection methods that drive those theories. Koester presented information on the updates that have been made to the latest edition of *Lost Person Behavior*. To summarize search theory, Koester said that the goal of search theory is to maximize success by utilizing the collected data to predict the most likely places that a person would be found. One of the ways that we can calculate the success of a particular search is to take the Probability of Area (POA) and multiply it by the Probability of Detection (POD) to come up with the Probability of Success (POS). As a part of Search Theory, Koester explained that that the way that humans navigate, using landmarks, distances and sense of direction, can influence the way that we search for a lost person. One of the additions to his previous research includes the introduction of a disorder that affects a number of people who get lost often, even in daily life. The symptoms for Developmental Topographical Disorder (DTD) include being lost multiple times a week in familiar locations, disorientation since childhood, no other cognitive issues and no other brain injuries or neurological disorders. Those with DTD are unable to associate a direction of travel with landmarks, have difficulty following routes with left and right turns and often have a genetic predisposition for the disorder. DTD affects roughly 3% of the



2025 ICAR TERRESTRIAL RESCUE COMMISSION REPORT



population, Koester said. Though most people with DTD are undiagnosed and unaware of the disorder, those with DTD often defy the methods used to find the lost person and are often therefore outliers. Koester also discussed the impact that AI is having on establishing the POA, citing several other influences on the POA such as the knowledge brought to bear by Subject Matter Experts (SMEs) and stochastic thinking (randomly determined; having a random probability distribution or pattern that may be analyzed statistically but may not be predicted precisely) to use an Ensemble approach to Lost Person Behavior.

Looking at a scenario through the eyes of the lost person, there are often lost person strategies employed to try and find their way. These strategies include:

- Sampling
- Backtracking
- Landmarks
- High points and cell coverage
- Downhill travel
- Staying put or doing nothing

Since the first printing of Lost Person Behavior in 2007, Koester and others have gathered and logged data for nearly 300,000 incidents, providing a hefty bank of data to mine. Several new subject categories have been added to the latest edition, including:

- Abductions
- Aircraft
- Autistic
- Avalanche
- BASE Jumper (winged and not)
- Beacons
- Brain Injury
- Bridge Jumper
- Cell phone forensics
- Child
- Fugitive Hikers Human Remains
- Mentally Ill
- Motorcycle
- Other
- Parachutist
- Runaway
- Water (AC Ditch, Bridge Jumper, Scuba and PIW Ice)
- Wide Area Search (Avalanche, Floods, Fire and Landslide)

Additionally, Koester covered the pros and cons of Personal Locator Beacons (PLBs) and other digital distress call devices and how they can impact both Lost Person Behavior and POA.

The roughly 300,000 incidents in the ISRID database, several interesting conclusions can be drawn. For instance, there is practically no difference between the distance travelled by lost men versus lost women. For men and women, the percentage of survivability for men is higher than women for roughly the first week. But after one week (and up to 21 days), statistically women have a higher survivability rate than do men. There are several survivability factors at play when determining who has the best



2025 ICAR TERRESTRIAL RESCUE COMMISSION REPORT



chance to be found alive. Age, average temps, hottest temp, coldest temp, wilderness vs urban, subject category, gender mental fitness, eco-region and terrain all factor in to the survivability of the lost person. When it comes to the survivability of a lost individual versus that of a lost group, the lost solo traveler is 370% more likely to perish than someone in a group that is lost.

For more information about Lost Person Behavior, Koester encouraged everyone to reach out to him at robert@dbs-sar.com .

Rescue and Communication on the Mount Blanc Massif, Oceane Vibert and Major Frederic Auvet

With Vibert representing the volunteer organization Le Chamoniarde in Chamonix, and Major Auvet representing the French police/SAR helicopter organization PGHM, both discussed the complexities of effective communication during SAR operations on the Mount Blanc massif. With France, Italy and Switzerland all sharing SAR responsibilities on the mountain, multiple methods of communication have to be employed.

In 1987, the VHF radio network Securite' Alerte Mont Blanc was established. It has 4 repeaters and two listening bases on the mountain. At 150MHz, the VHF network offers both digital and analog comm options, and provides fairly predictable operational reliability. But it's limited range (primarily line of sight) and inability to transmit data begs for another communication option in different scenarios. Several large-scale MCIs involving avalanches made it clear that no single line of communication can provide a complete comms package.

The current communication plan makes use of VHF, 800MHz radios and cell phone communications, and seems to be meeting their needs during SAR operations.

Modernization of Terrestrial Rescue Equipment and Techniques in the Slovenian Mountain Rescue Service, Dr Miha Kenda

This presentation traced the evolution of the Slovenian Mountain Rescue Service's rescue tools and techniques from its modern era start in the 90s through present day. Slovenia is a mountainous Central European country, with 78% of its land mass covered by mountains. It has 352 peaks that are above 2,000 meters, and as a result, the all-volunteer Mountain Rescue Association of Slovenia adopted many of the tools and techniques of its rock climbers and cavers back in the 90s.

Their early rope rescue systems were based around the Petzl Stop, semi-static EN 1891 Type A ropes and a 10:1 Safety Factor for anchorage systems. After their initial innovations in the 90s, their tools and techniques remained largely unchanged until 2023.

When revamping their tools and techniques in 2023, lightweight, high efficiency personal gear was selected, and the techniques that were employed with both the new personal and team rescue gear stressed simplicity and even rope access techniques.

The benchmark for the team equipment was multi-functionality and more simplified and efficient hauling. This prompted their move to the Petzl Maestro Decent Control Device and Rescucender rope grab for quick 3:1 and 5:1 rescue load hauling. For personal mobility, the Petzl ID, RollClip and ProTraxion were selected for use on their two tensioned rope systems.

DAY TWO PRESENTATIONS



2025 ICAR TERRESTRIAL RESCUE COMMISSION REPORT



Mountain biking accidents in the Polish Carpathians – old activity, but a new rescue challenge, Pawel Kroh & Adam Tyszecki / GOPR

Kroh and Tyszecki presented how the Beskid Group of GOPR adapted to the challenges of rescues of subjects injured in mountain bike accidents. As has happened in many jurisdictions during the pandemic, mountain biking participation increased significantly in 2020 in the Carpathian Mountains and its popularity has continued. With more use has come more incidents that resulted in injuries.

Besides the increased call volume, GOPR identified multiple other challenges. The area had multiple unmapped trails so it was often difficult to locate subjects. They responded by mapping the area and pre-planning access routes. Once on scene, rescuer safety was a concern because there was a possibility that other mountain bikers could collide with GOPR personnel on scene so they adopted measures to close trails and post warnings about ongoing rescue operations. Because of the relatively high speeds of mountain biking, GOPR noted that nearly 50% of cases involved injuries to the spine, head, chest pelvis or abdomen. These more serious injuries are more likely to be life threats and require faster transport to a higher level of care. GOPR developed trailers for their ATVs that could access incident sites more quickly and evacuate patients in litters more quickly.

CASE STUDY-Helmet development, Stein Møller / Norsk Luftambulans

Møller detailed the design and development process for a helmet that met the specific needs of the Norwegian Air Ambulance Foundation. The basic problem was that the rescue technicians would need to switch helmets once they arrived on scene via helicopter. There was no single helmet that was appropriate for all their mission profiles: hoist, water rescue, ground-based mountain rescue (summer and winter) and motorized access. The design team determined that the solution should be certified to all three of the following standards: EN 1385 (whitewater), EN 1077, Class B (Alpine skiing) and EN12492 (mountaineering).

The team worked with the Norwegian helmet company Sweet Protection to develop the Ascender SAR 2Vi helmet that satisfied the requirements of the diverse mission profiles and was certified to the identified standards.

The helmet:

- Triple-certified SAR helmet
- Incredibly strong carbon fiber hybrid construction
- Multi-density shock absorbing structure
- Mips implementation to reduce rotational forces on the brain
- Extremely light weight and low volume
- Clockwork SAR protective goggle compatible
- Mounts for headphones and goggles
- Mounts for lights, cameras and NVG in the front
- One helmet for all operations



Rope Rescue Tactics in Alpine U.S. National Parks - Terrestrial Approaches to Diverse Mission Profiles, Nicholas Armitage / National Park Service USA

In this presentation, Grand Teton National Park ranger Armitage outlined the different approaches of the six different national parks that have active terrestrial rope rescue operations (Denali, North Cascades, Mt. Rainier, Grand Teton, Rocky Mountain and Yosemite).

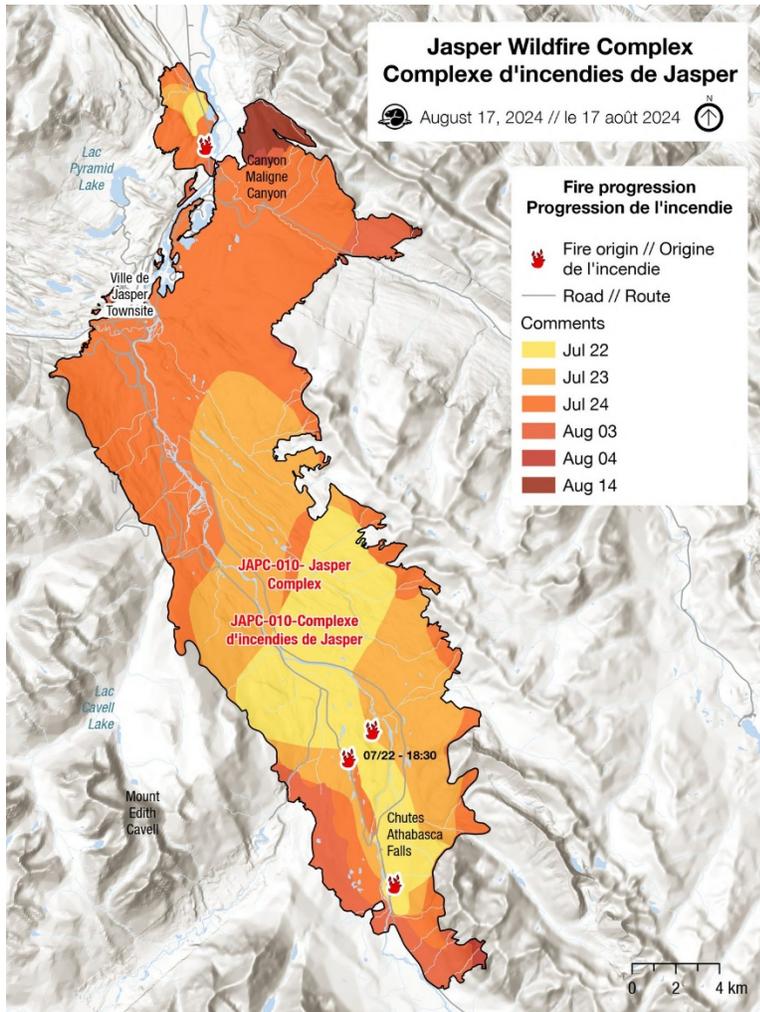
Although these parks are all administered by the U. S. National Park Service, each park has developed particular techniques due to different mission type, terrain, environment and visitation. Although two rope systems are the standard, single rope guiding/partner rescue techniques are becoming more widely used for ambulatory subjects.

The different approaches between parks are well illustrated when comparing Denali and Yosemite. Featuring both high altitude and a northern latitude, Denali has a short, cold climbing season with a relatively small number of climbers. Dealing with extremes of altitude and cold in a mountaineering environment, the rigging tactics are developed around use in glaciated and crevassed terrain. Yosemite SAR, with a lower elevation, less extreme weather during a longer climbing season and a much larger visitation profile has developed techniques suited to rescuing big wall climbers.

Despite the diverse mission profiles and the fact that the National Park Service has not mandated or standardized rope rescue operations between the separate parks, there are still strong similarities in component-based systems and equipment selection between the different parks.

Wildfire Backcountry Evacuation and Fire Fighter rescue in Jasper National Park Canada--Cory Boschmann / Parks Canada

This was the story of how the threat of a large, fast-moving wildland fire complex was addressed within Jasper National Park in July and August, 2024. Boschmann detailed the efforts of three main phases: evacuating park visitors who were in campgrounds and in the backcountry, evacuating Jasper town site and recovering a firefighter killed during the fire.



Four separate fires were reported on July 22, 2024. Because of the hot and dry conditions, rangers recognized that they had to evacuate campers and backcountry travelers from threatened areas. Evacuating the campgrounds was relatively easy but in many cases, there was no way to contact backcountry travelers. Helicopters were assigned search areas ahead of the fire and evacuated parties when found. All backcountry travelers were evacuated safely. By July 24, 2024, the fire had reached the Jasper town site and the town was evacuated. Thirty percent of buildings in town were consumed including houses of Canada Parks employees.

On August 3, 2024, a wildland firefighter was killed by a fallen tree while fighting the wildfire. Parks Canada personnel worked with wildland firefighters to package and extricate the body using a helicopter. The after-action report identified steps that Parks Canada is taking in

the aftermath of the fire. Regarding the backcountry evacuation, they identified the following tasks: establish predefined backcountry evacuation zones, improve communication methods, implement backcountry evacuee tracking system, ensure proper PPE and training and establish pre-evacuation protocols. For the recovery of the deceased firefighter, Parks Canada identified the following tasks: Improved helicopter coordination, improved helipad placement, clarification of roles and expectation, medical unit reporting structure and improved communications.