

Search and Rescue in the Wild

Arthur J. Buys, CIMA®, Holland Professional Club, December 11, 2014

One of the great opportunities we have in the United States of America is exploring and enjoying diverse ecosystems that are protected for our enjoyment on federal and state lands. The U.S. Forest Service manages 154 national forests and 20 grasslands encompassing 193 million acres of land – including 439 wilderness areas totaling over 36 million acres of land. Additionally, there are over 6,600 state park sites in the United States covering 14 million acres of land. The vastness and variety of these parks, hosting over 450 million visitors per year, leads to situations where people are lost or are in need of assistance to safely leave these forests and grasslands and return to their families. We should also keep in mind that people find themselves lost and in need of assistance on private lands as well.¹

There are three key topics I will address about search and rescue operations in wilderness settings:

- 1) What organizations are involved in search and rescue operations and who are the people that participate in these efforts?
- 2) What can people who need assistance do to help rescue personnel and increase their chance for survival?
- 3) Who should pay for these potentially very expensive rescue operations?

I believe we should begin exploring these topics with a story that provides real world examples of organizations, people and resources in search and rescue efforts. One of the most important facts we must recognize is that the vital part of the search and rescue operations is the role of organizations made up of volunteers that work with federal, state and local authorities. These volunteers provide a broad array of skill sets to meet the needs for the enormous variety of terrain and climate challenges. The main criteria for the people who give their time is a willingness to learn needed skills and to commit the time and accept the risk associated with participating in rescue operations. Too often it seems the media in our country focuses on tragedy and failures. The story I have chosen is personal and reflects the vast majority of the rescue efforts – they find the people in need of help and those people return to their families.

The story is also my inspiration for learning about search and rescue in the wild. As members of the Holland Professional Club you may remember my last paper on Lyme disease. My son, Drew, struggled through an undiagnosed case of Lyme disease for over five years. He went from being a successful high school athlete to periodically needing a cane to walk. He was successfully treated for the disease and has returned to an active lifestyle – especially enjoying the outdoors. As you may be guessing, yes, Drew went hiking and became the beneficiary of a successful search and rescue operation.

¹ “U.S. Forest Service – About the agency”, <http://www.fs.fed.us/about-agency>

As part of the recovery process from Lyme disease my son wanted to return to college someplace warm to ease the aches and pains associated with his recovery from the disease. In January of 2012 Drew moved to Arizona to stay with my father in Tucson and attend Pima College. He was progressively feeling better and getting exercise by doing regular day hikes around Tucson, and a few short overnight hikes with friends. Drew was doing well in classes and enjoying the outdoors.

In March of 2012 he told me about his plan to go on a multi-day hike over his spring break in the Mazatzal Wilderness Area in mountains north of Phoenix – and also mentioned that he may not be able to find someone to hike with him. I will share some key recommendations from search and rescue personal as I tell you the story, the first is – ***do not hike alone***. Recognizing my son’s commitment to making the hike I sought a solution that would allow him to call for help in an area without cell phone coverage. After some research I decided to buy some “insurance” of a sort – I bought him a “personal locator beacon” (ACR PLB-375, \$270). Basically the beacon allows people to send a signal to a satellite indicating they are in an emergency situation and provide coordinates for their location. Additionally, the model I purchased sends a short range signal (121.5Mhz) to allow searchers to hone in to a more specific location. After providing Drew assurances that the beacon did not track him, it only would be activated at his discretion and he agreed to take the PLB with him.

Drew’s grandfather dropped him off at the beginning of his planned trail on March 9, 2012 (another key recommendation -- ***always give someone your hiking route and schedule***) [\(present image of Drew before hike\)](#). My wife and I often thought of Drew on his first major post-Lyme disease outing – we were both happy and concerned. On the morning of Saturday March 17, when Drew was scheduled to complete his hike, my wife and I were driving to Grand Rapids to see our daughter in a water polo tournament. The phone rang as we were driving down 16th Street and I pulled into the nearby parking lot at Meijer – the voice on the phone said “this is Sargent Major Kim from Air Force Search and Rescue, this is the number provided by Andrew Buys to call when his beacon has been activated”. The Air Force Rescue Coordination Center formulates and manages search plans, agreements and policies throughout the continental United States.² The Sargent Major proceeded to ask questions related to verifying Drew’s planned hiking route and schedule, and to confirm the beacon signal coincided with an area near his planned route. He told me the procedure was to wait for a receiving satellite to pass over the area to confirm the location (approximately two hours). After the confirmation of location the Sargent Major contacted the local authorities to begin a search and rescue effort and notified them my father was at the trail head with a map highlighting Drew’s planned route [\(display the map of Drew’s route\)](#).

At the time of this event I did not fully understand all of the people who were involved in a search effort, I was just thankful they were experienced and committed to finding my son. I

² “Air Force Search and Rescue Coordination Center”, <http://www.1af.acc.af.mil/library/factsheets/factsheet.asp?id=7497>

tried not to focus on the unknown – why Drew activated the beacon and was he still okay. Now, with research, I have a better understanding of the organizations and people who were coming to his aid.

Once it has been determined that a person is in need of rescue, a search area must be defined (another key recommendation – ***carry a map, compass and ideally a GPS***). In Drew’s case he had the personal locator beacon I sent him in addition to a map and compass -- and was able to activate the PLB. This provided not only a search area based on more than his hiking plan but indicated he was in a situation that required assistance. A PLB with a built in GPS relays coordinates to provide a precise locations versus a 2 to 3 mile area without the GPS feature. In this case the GPS coordinates were distorted by the terrain but still a 2 to 3 mile area is vastly better than a search area of well over 100 square miles. The PLB provided key information that is too often not a resource for search and rescue groups. The U.S. Air Force Rescue Coordination Center received the signal, contacted the people listed on the PLB registration (owners should register their device and there is no fee involved) to verify key details of the person’s location and potential situation. Upon confirming key facts the center contacts local authorities to begin the search and rescue operation.

The consistent structure in search and rescue operations across the country is local officials act as coordinators for search and rescue operations and volunteers are the primary resource for efforts on the ground. Most often the coordination occurs at the county level through the Sheriff’s Department as was the case for the Mazatzal Wilderness Area. The Gila County Sheriff’s Department works with the Tonto Rim Search and Rescue in the Mazatzal area but they were committed to another rescue for a hiker who had fallen and broken bones. In this case coordination meant calling the neighboring county, Maricopa, and their team, Central Arizona Mountain Rescue Association, who gathered their equipment and made the five hour trip from the Phoenix area. As the SAR team was traveling from Phoenix, Gila County Sergeant Terry Hudgens arranged to have a helicopter fly from the city of Kingman to try to locate Drew. The helicopter was in flight when a third incident occurred requiring immediate rescue – the helicopter was re-routed to evacuate another person who had been located and required medical assistance. Sergeant Hudgens then called the Maricopa County Sheriff’s office and they sent another helicopter to look for Drew. By this time they were beginning to lose the advantage of daylight.

The team from Central Arizona Mountain Rescue Association represented a variety of men and women from diverse backgrounds. My father had a chance to speak with several of the team members as they were waiting for the helicopter to arrive. The team included expert mountain climbers, search and rescue dogs and their handlers, people with emergency medical training and people who loved the outdoors and were ready to hike into unfamiliar terrain to look for any signs of our missing son. Their backgrounds ranged from retired school teachers to people with military training – all with a common interest of helping people return safely from the rugged mountain area. As with all search and rescue organizations I found in my research, they

commit to regular training throughout the year and worked to learn new skills that are valuable in these lifesaving efforts. On this day they just waited to hear from the helicopter and simply ran out of daylight and were asked to return on Sunday. We did receive great news just as light was running out, the helicopter team spotted the glow of a campfire within a slot canyon that was likely Drew Buys.

My father was told the search would resume at 8:00am Sunday morning. By the time he arrived at 6:30am the team from Central Arizona Mountain Rescue Association was ready to support the rescue effort and, due to the knowledge gained about Drew's location, the Maricopa County Mounted Posse had arrived recognizing horseback was likely the best overland way to reach the canyon where the helicopter had spotted Drew's campfire. Early in the morning a state police helicopter had flown from Kingman to try to visually locate Drew and directly retrieve him if possible. During the helicopter's search the radio signal was blocked by a mountain between helicopter and the search and rescue staging area. At approximately 7:30am the helicopter flew over the mountain and radioed they had Drew on board and he was suffering from dehydration but was otherwise in good condition. My father's comment to me summed up all of our feelings, "Seeing him step out of that helicopter this a.m. was one of the happiest moments of my life".

Now I believe it will be instructive to consider key strategies that individuals in need of assistance can implement to make the job of search and rescue teams most successful. Although the number of people in search and rescue situations is not as high as we might assume, lives are at stake. For example, in Yosemite, one of the busier national parks, "rangers and search and rescue (SAR) personnel respond to approximately 250 emergency incidents in each year".³ A study of California located National Parks found that "the overall occurrence of nonfatal events was 9.2 people per 100,000 visits. . . . Seventy-eight mortalities occurred during the three years studied, resulting in an overall mortality rate of 0.26 deaths per 100,000 visits."⁴ Naturally one of the goals of organizations involved in search and rescue operations is to reduce the number incidents and increase the efficiency and outcome of efforts when teams are mobilized. This goal reaches beyond their training and resources to the planning and preparation of people who venture into the wild.

Since parents know how much our children like to be judged when they make mistakes, let's say we will use my son's experience as a "learning opportunity". Drew's situation does provide the opportunity to compare his planning, preparation and decision making to the recommendations of search and rescue organizations. I have mentioned a few key recommendations to this point of the presentations and now let us look at recommendations of search and rescue teams in more depth.

³ "Yosemite National Park – Search and Rescue, Lessons from the field", <http://www.nps.gov/yose/blogs/psarblog.htm>

⁴ Montvalo, Wingard, Bracker and Davidson, "Morbidity and mortality in the wilderness", April 1998, Western Journal of Medicine <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1304948/>

I found variations on “Ten Essential Categories” and felt the following list was well done in “Wilderness Survival and Safety” by Matt Fields (<http://www.chelansar.org/ten-essentials/>). He is a retired 31-year law enforcement veteran. Most recently, he spent 17 years as a Forest Patrol Deputy, attached to Special Operations/Search and Rescue, with the Chelan County, Washington, Sheriff’s Office. The following is his version of essentials for venturing into the wilderness and comments about how Drew’s preparation and decisions compare to the “essentials” search and rescue teams advocate.

TEN ESSENTIAL CATEGORIES

NAVIGATION- Map, Compass, GPS

- Yes. He had a map and compass but veered off a hiking trail that was not well defined or heavily traveled. Although he shared his planned route he broke a key recommendation by hiking alone. Flu-like symptoms impacted decision making and he mistakenly followed an animal trail down toward the canyon base. He was without adequate water and did not feel he had the energy to climb the steep path to attempt to find the proper trail. He continued down into the canyon to find water. Drew also did not leave “clues” as he traveled into the canyon that would have helped the search and rescue team track him.

COMMUNICATION- Whistle, Signal Mirror, Cellular Phone, Note Pad and Pencil

- Yes. He had a signal mirror, cellular phone, and personal locator beacon (PLB). The rescue team was able to find Drew in spite of him veering off his planned path thanks to the use of the PLB. He had heard the helicopter the first night but, when help did not arrive, thought they did not see him. Sunday morning he heard the helicopter again (he had little sleep Saturday night) but had managed to pack tent and gear and move into a clearing to signal with his mirror – and they spotted Drew and rescued him.

LIGHTING- Flashlight and/or Headlamp, Spare Batteries

- He had a headlamp without spare batteries or spare bulb. He relied on his ability to make fire.

EXTRA CLOTHING- Base Layer, Middle Layer, Outer Layer, Head Covering, Gloves

- He chose to travel light, and particularly with onset of dehydration (perhaps related to altitude sickness), did not have enough extra clothing. There was a risk of a late snow storm in the days ahead but he did not have adequate clothing – especially recognizing his physical condition.

FIRST AID- First Aid Kit, Medication, Sun Protection, Blister Protection, Insect Protection

- Yes. He had a very basic first aid kit along with sun and insect protection

FIRE- Matches in Waterproof Container, Fire Starter

- Yes. He had matches and fire starter.

TOOLS- Knife, Pocket Saw, Tool Kit

- Yes. He had a knife and multi-tool.

WATER- Water Container, Water Purification

- Yes. He had water purification equipment but, once he was ill, did not have adequate water sources available relative to water storage capacity. After he realized he was far off his trail, he was able to use the water purification in small pools he found within the “slot” canyon.

EXTRA FOOD- High Energy Food Items

- Yes. He had adequate food for the trip but was not able to “keep down” the food due to altitude sickness and/or dehydration.

SHELTER- Poncho or Tarp, Bivy Sack, Sleeping Bag, Ground Pad, Space Blanket

- Yes. He had adequate shelter gear with him. Due to his physical condition and nightfall, he had to set up camp in the slot canyon (this carried a risk of flash floods).

All of the “ten essential” categories improve search and rescue teams’ ability to complete their mission and reduce the risk to the teams themselves. Drew had done a better job than many who hike in the wilderness but the search and rescue crew was extremely thankful that he had and used his personal locator beacon – saving them time, resources and allowing them to save Drew. After he was safe, one of the team from Maricopa County told my father that three solo hikers were lost in recent years in the Mazatzal Wilderness Area and never found. In this case, thanks to covering most of the highlighted essentials but especially the personal locator beacon, the teams involved had a victory and my son came home to his family!

As I am sure you can image, when a loved one is lost in the wilderness and you fear for their health, safety and life -- the cost and how the expenses are paid are of little concern. As I am sure you can relate to, if someone told me that I needed to turn over all my worldly possessions to pay for the necessary resources to assure my son’s safe return, I would comply in a heartbeat. As we take a step back from personal and emotional feelings related to search and rescue missions, we must recognize the costs can be significant and it is legitimate to consider who should pay the bill.

In the example of the search and rescue operation I provided, federal, state, county and volunteer resources were called upon for a successful mission. The cost for search and rescue

operations have a range of \$200 to over \$50,000 (an average of approximately \$6,000).⁵ In this case, if we just consider the relatively limited use of helicopters at \$1,600 an hour, the two round trips to the Mazatzal Wilderness Area would total approximately \$11,200 – and this was a case where they had a very limited search area due to the use of the PLB. What would the cost have been if the search area was his entire eight day route? Having the opportunity to enjoy our nation’s federal and state wilderness and the tourism dollars that are meaningful to nearby communities do have associated costs. There is a recognition that search and rescue operations are “a part of doing business” but there is a debate about how the costs of these operations are recouped and, particularly, there are questions of who pays when someone requires search and rescue due to their own negligence.

As we are aware, the federal and state budget have not been well managed so the cost of search and rescue operations comes under greater scrutiny – and perhaps the issue should have been more thoroughly considered years ago. There have been two basic approaches to addressing cost issues with financial resources outside of the operating budgets of government entities. One is a user fee approach – adding costs to hunting, fishing and similar licenses, and perhaps creating additional licensing permit systems, to cover potential search and rescue operations. The second approach may be blended with the user fee concept but adds an element of judging whether the search and rescue mission was due to negligence and, if so, requiring the person to pay for the related expenses. The people often most directly involved in search and rescue efforts, the volunteer search and rescue organizations, oppose any plan that requires people to pay for their rescue. One thing all side agree upon is that it is difficult to debate an issue that ultimately deals with people who find themselves in life threatening situations in the wild.

The state of Arizona has a more traditional system, in fact a state law, which requires each county to have search and rescue teams. They are volunteer organization that are promoted, recruited and coordinated by the sheriff’s offices. As with the vast majority of states, there are no costs passed on to the people requiring the mobilization of the search and rescue efforts.

The state of Colorado has developed a system to help offset the costs associated with search and rescue efforts without requiring reimbursement for search and rescue expenses. Individual municipalities or taxing districts have, rarely, charged people they felt were reckless – this rarity is due in part to the Colorado Search and Rescue Fund, established in 1987 “for the purpose of reimbursing political subdivisions and search and rescue organizations for expenses incurred in conducting search and rescue operations within the State of Colorado.”⁶ The primary funding source is in essence a surtax on licenses and permits (\$0.25 each) related to outdoor activities like hunting, fishing, boating and snowmobiling. Additionally Colorado established a Colorado

⁵ “N.H. Fish And Game Holding Hearing On 'Hike Safe' Card”, 9/8/2014, New Hampshire Public Radio <http://nhpr.org/post/nh-fish-and-game-holding-hearing-hike-safe-card>

⁶ “Colorado Search and Rescue Fund – Frequently Asked Questions” <http://cpw.state.co.us/Documents/Boating/SearchAndRescueFAQ.pdf>

Outdoor Recreation Search and Rescue (CORSAR) card, that cost \$3 for one year or \$12 for five years. This revenue provides additional support to the Colorado Search and Rescue Fund – the card is a source of contributions only and is not required for cost-free search and rescue.⁷

In Alaska visitors to Denali National Parks pay a \$10 entrance fee but a Mountaineering Special Use Fee for the climbing season (October 1, 2014 through September 30, 2015) of \$365 “which the park uses to cover expenses directly related to climbing, including stationing rangers at high altitudes and providing orientation services that are intended to reduce the chance that climbers will need rescuing.” The state of Alaska does not charge people for search and rescue operations.⁸

Just a handful of states, including New Hampshire, Oregon, Maine and Idaho, have laws authorizing local agencies to bill for rescues when factors such as recklessness, illegal activity or false information led to the predicament.⁹ New Hampshire had a highly publicized case as they tried to apply their law. The state “fined a Boy Scout \$25,000 after he departed from marked trails, sprained an ankle, and required a rescue. Using a 1999 law that allows for recovery of costs in cases in which the state department of fish and game determines negligence” the Boy Scout was sent the bill¹⁰ New Hampshire adds \$1 to a variety of outdoor licenses and permits and also is trying to raise additional funds for search and rescue operations with an optional card similar to Colorado’s CORSAR. The difference is the card has a higher cost, \$25 for individuals and \$35 for families, and it provides a waiver from the state seeking reimbursement due to what may be deemed “negligence” in a search and rescue scenario (but does not exclude “recklessness”).¹¹

Many state budgets across the country are under stress forcing policymakers to look for ways to cut costs and increase revenues. This is leading to the consideration of charging for search and rescue, especially in instances deemed to be reckless or even the lower standard of negligent acts. An important voice in this debate are the organizations directly involved in search and rescue operations -- and I could not find any SAR organization in favor of charging people. Organizations opposing charging for SAR services include: Mountain Rescue

⁷ “Fact Sheet – Colorado Outdoor Recreation Search and Rescue Card”, <http://www.coloradosarboard.org/csrb-documents/CORSARCardFactSheet.pdf>

⁸ David A Graham, “Who should pay to rescue stranded climbers?”, 12/16/2009, Newsweek <http://www.newsweek.com/who-should-pay-rescue-stranded-climbers-75845>

⁹ Laura Zuckerman, “For some stranded U.S. adventurers, rescues come at a cost: Some states have laws authorizing local agencies to bill for rescue operations”, 2/18/2013, Chicago Tribune/Reuters http://articles.chicagotribune.com/2013-02-18/travel/sns-rt-us-usa-rescues-costsbre91h0dk-20130218_1_helicopter-rescue-snowmobilers-state-house-panel

¹⁰ Fact Sheet – Colorado Outdoor Recreation Search and Rescue Card <http://www.coloradosarboard.org/csrb-documents/CORSARCardFactSheet.pdf>

¹¹ “Hike Safe – There and Back”, <http://hikesafe.com/index.php?page=the-nh-hike-safe-card>

Association, National Association for Search and Rescue (NASAR), US National Park Service, and US National SAR Plan (FEMA, National Park Service, US Coast Guard).

There are three key points made by groups opposing pay plans:

1. Fear of being charged may lead to poor decisions that complicate SAR operations: a 24 hour delay creates a 50% drop in probability of survival; subjects have hidden or run away; family and friends attempt search and rescue on their own have become injured or lost themselves.¹²
2. Society rescues people all the time -- auto accident victims, home fire victims, homeless people, war refugees, plane crashes, illegal immigrants, single mothers, the jobless, substance abusers – and at far greater cost than wilderness hiker rescues. Many of those lamentable situations are the result of life decisions every bit as poor and irresponsible as the most careless hiker, and they benefit from government funded emergency services.¹³
3. A succinct statement about how search and rescue teams view their role, without the intrusion of a person's fear of a large rescue bill, was in a presentation at a Canadian based Search and Rescue Conference, "We all signed up to rescue and recover both the unlucky . . . and the stupid!"¹⁴

There is one vital survival tool that is indispensable, sound decision-making when you find yourself in a difficult situation. This is the focus of a program for children develop by National Association for Search and Rescue called "Hug-a-tree". Within the program is great guideline for all ages built on the acronym "S.T.O.P.":

S is for Sit Down: This is the first and most important step in staying calm.

T is for Think: Ask yourself the most important questions, such as "How did I get here?" "How much time is left before it gets dark?"

O is for Observe: Try to identify landmarks, such as mountains that can help you figure out your position. Listen for sounds, like traffic, running water or even gunshots, which can help you find your way back to safety. Ask yourself the most likely places to look for firewood and shelter.

¹² R. Don Blakely, "Charging for Search and Rescue", SARSCENE 2010 Conference
http://www.sarscene.ca/SARSCENE_2010/PowerPoint%20presentations/M-0900%20Opening%20Plenary/CHARGING%20FOR%20SEARCH%20AND%20RESCUE.pdf

¹³ Steve Howe, "Paying for Wilderness Search and Rescue: Private Cost or Public Obligation", Backpacker,
<http://www.backpacker.com/news-and-events/news/rescue-of-the-week/paying-for-wilderness-search-and-rescue-private-cost-or-public-obligation/>

¹⁴ R. Don Blakely, "Charging for Search and Rescue", SARSCENE 2010 Conference
http://www.sarscene.ca/SARSCENE_2010/PowerPoint%20presentations/M-0900%20Opening%20Plenary/CHARGING%20FOR%20SEARCH%20AND%20RESCUE.pdf

P is for Plan: Decide if you should try to make it out of the woods or stay put until morning. In making this all-important decision, consider how much easier it is to gather firewood during daylight. The rule of thumb is to make a pile as large as you think will last the night, then make 10 more just like it. People who have been forced to spend the night in the woods have been surprised by how much wood they need to keep their fire going.

For a more detailed overview I found a document by the Mountain Rescue Association, titled “General Backcountry Safety”, to be a good overview for people planning to do anything from a day hike to mountaineering (http://www.mra.org/images/stories/training/backcountry_safety.pdf).

People will continue to venture into the natural and wild areas of our country, and they will continue to find themselves in circumstances where, regardless of preparations and decision-making, they will be thankful professionals and volunteers are ready to come to their aid.