

Backcountry Search and Rescue Study

Senate Bill 21-245 (C.R.S. §33-10-116)



COLORADO

Parks and Wildlife

Department of Natural Resources



Photo credit: Arapahoe Rescue Patrol

Published January 17, 2022

Table of Contents

ACKNOWLEDGEMENTS	1
EXECUTIVE SUMMARY	3
INTRODUCTION	11
CHAPTER 1 - COORDINATION STRUCTURE	19
PARTNER COORDINATION	19
BSAR TEAM PLANNING AND ADMINISTRATION	26
STATE SAR COORDINATORS	28
CHAPTER 2 - PROTECTIONS AND BENEFITS	30
GOVERNMENTAL IMMUNITY	31
WORKERS' COMPENSATION	33
RETIREMENT BENEFITS	37
OTHER BENEFITS	39
CHAPTER 3 - TEAM FUNDING AND SUPPORT	41
CHAPTER 4 - INDIVIDUAL AND TEAM EXPENSES	50
INDIVIDUAL COMPENSATION AND REIMBURSEMENT	50
TEAM EQUIPMENT	54
CHAPTER 5 - PHYSICAL AND PSYCHOLOGICAL SUPPORT AND RESOURCES	56
CHAPTER 6 - TRAINING	62
CHAPTER 7 - PUBLIC OUTDOOR SAFETY EDUCATION	68
CHAPTER 8 - DATA COLLECTION AND REPORTING	74
CONCLUSION	77
NEXT STEPS	78
APPENDICES	79
APPENDIX A	80
APPENDIX B	82
APPENDIX C	83
APPENDIX D	84
APPENDIX E	85
APPENDIX F	106

ACKNOWLEDGEMENTS

The authors of this study would like to thank the following organizations and individuals who participated in the surveys or were consulted as part of the study process. Their ideas, feedback, and suggestions were carefully considered and reflected in this study. They were asked for their input on backcountry search and rescue (BSAR) in Colorado but were not asked to endorse this report. We should also note that this list is incomplete, and many individuals contributed in their own capacity or as part of a group conversation.

We would like to thank the organizations who invited us to discuss and provide input on the study as part of their meetings:

- Colorado Search and Rescue Association
- County Sheriffs of Colorado

And the many organizations and agencies that participated in consultations or interviews:

- Alpine Rescue Team
- Big Agnes
- Bureau of Land Management
- Colorado Attorney General's Office
- Colorado Backcountry Hunters and Anglers
- Colorado Department of Law
 - Colorado Peace Officer Standards and Training
 - Workers' Compensation Unit
- Colorado Department of Local Affairs
- Colorado Department of Natural Resources
 - Colorado Avalanche Information Center
 - Colorado Parks and Wildlife
- Colorado Department of Public Safety
 - Colorado Division of Homeland Security and Emergency Management
- Colorado Mountain Club
- Colorado Nonprofit Association
- Colorado Off-Highway Vehicle Coalition
- Colorado Outdoor Recreation Industry Office
- Colorado Department of Personnel & Administration
 - Division of Human Resources
- Colorado Search and Rescue Association
- Colorado Snowmobile Association
- Custer County Search & Rescue
- El Paso County Search & Rescue
- Mountain Rescue Association
- National Parks Service
- Recreational Equipment, Inc.
- Routt County Search & Rescue
- Singletrack Trails
- Summit County Open Space & Trails Department
- Summit County Rescue Group
- United States Forest Service
- Washington State Emergency Management Division

The BSAR workgroup, including Sheriff Rick Albers, Commissioner Kristie Borchers, Perry Boydston, Heather Dugan, Sheriff Jamie FitzSimons, Sheriff Anthony Mazzola, Ethan Greene, Director Stan Hilkey, Clayton Horney, Austin Lashley, Ty Petersburg, Jeff Sparhawk, Undersheriff Donnie Patch, Sheriff Justin Perry, Doug Vilsack, Sheriff Garrett Wiggins, and Woody Woodward provided direction to the study, participated in an in-person summit, and reviewed the final draft of the report.

Thank you to Ascent Multimedia for helping to create a promotional video for the survey.

Report Authors

Alex Alma
Dale Atkins
Michael McIntosh

Physical and Psychological Health Chapter

Laura McGladrey
Paul Cook
William Mundo

Have questions about this study report? Please email dnr_cpw.lerecords@state.co.us or write to:

Colorado Parks and Wildlife
6060 Broadway
Denver, CO 80216

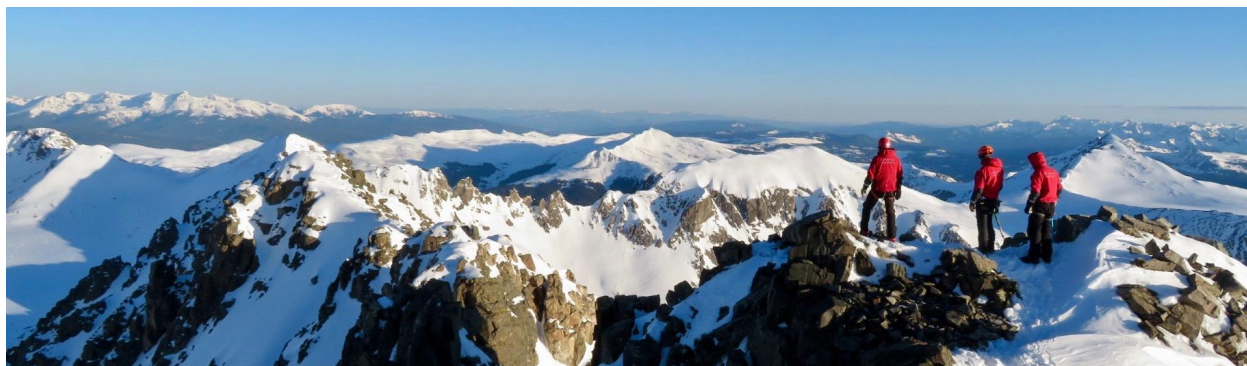


Photo credit: Summit County Rescue Group

EXECUTIVE SUMMARY

Background

Backcountry Search and Rescue (BSAR) is an essential service to search for, rescue, and sometimes recover deceased individuals from the backcountry at no cost¹ to the person in need. In Colorado, county sheriff's have authority over BSAR incidents, and they often rely on volunteer non-profit BSAR teams to carry out BSAR responses. While these BSAR partners and others continue to successfully operate with the resources that they have, the BSAR system, as a whole, is strained.

Increasing outdoor recreation use statewide and evolving recreational activities are leading to the accumulation of unaddressed challenges at both the team/agency and individual levels. County sheriffs are increasingly depending on BSAR teams that are struggling with membership challenges, limited availability, legal protections, and other considerations. BSAR volunteers are stretched to their limits across many categories, and are at risk of burning out. Core funding only comes from a handful of recreation user classes and has largely remained stagnant through the years. If left unaddressed, any one of these issues could result in a breakdown of the BSAR system in Colorado - a service that is vital to the health and safety of both residents and visitors.

Purpose

Colorado Parks and Wildlife (CPW) was directed, through the passing of Senate Bill (SB) 21-245, to study and address ten issues related to Backcountry Search and Rescue (BSAR): coordination structure, workers' compensation, retirement, compensation and reimbursement, equipment, funding, physical and psychological support, governmental immunity, training, and public outdoor safety education (the full language for each topic can be found in APPENDIX A). The purpose of the study is to better understand, in a holistic sense, the successes and challenges of BSAR. With this foundational understanding of the current system, the study team recommended sustainable and scalable solutions that will best address the needs of BSAR going forward. This is an exciting opportunity to be proactive and look to the future when increasing workloads often force BSAR partners to be strictly reactive. To our knowledge, this comprehensive study of a state BSAR system is the first of its kind in the nation.

¹ While BSAR rescues are free, medical care provided by local EMS or air ambulance services will likely incur charges.

Methodology

The study team used four methods to identify BSAR challenges and potential solutions: surveys, interviews, independent research, and a workgroup of BSAR leaders:

Surveys - Two separate surveys were conducted to collect important baseline data from key BSAR partners:

BSAR Volunteers - A survey designed to better understand each of the ten topics identified in SB 21-245 was sent to more than 50 non-profit BSAR teams across Colorado. Responses were received from 657 volunteers² across 49 teams, with 249 of those being self-identified volunteer leaders who were asked additional questions about team and system-level challenges. The survey included various validated instruments to assess demographics, experiences, and mental health outcomes, including depression, substance use disorder, post-traumatic stress disorder, chronic stress, and burnout to understand the mental and physical health of BSAR volunteers.

County Sheriffs - A separate survey was sent to all county sheriffs in Colorado, and responses were received from 41 sheriff's offices³, which were predominantly from counties that have BSAR incidents.

Interviews - The study team interviewed a wide variety of partners and subject matter experts during the course of this study. A full list can be found in the ACKNOWLEDGEMENTS section above.

Independent Research - Utilizing subject matter expertise brought by the study team, additional research was conducted to better understand BSAR issues, as well as to identify solutions and new approaches to specific challenges.

BSAR Workgroup - A workgroup composed of BSAR leaders and stakeholder representatives met with the study team on a biweekly basis through the study period to provide feedback and stay up-to-date on the study process. Additionally, on October 25th, 2021, many workgroup members participated in a BSAR Summit to provide direction to the study and better define what a sustainable BSAR model looks like. You can read the Summit Takeaways in APPENDIX B.

Study Team Reflections:

Gleaned through the conversations and research, the study team would like to share a few items with the reader. One, we found that there is often more commonality than difference both between and within BSAR teams. Groups often perceive that their challenges are so unique that others can't understand them. In reality, their issues overlap with others more than they realize and solutions would be better addressed through cooperation. For example, small teams may not have enough team members for one regular incident while large teams may not have enough to support multiple incidents happening at once. However, both teams are facing similar issues. Both share a need for additional trained members in a world of increasing BSAR calls.

² There are an estimated 2,800 BSAR volunteers in Colorado.

³ There are 62 sheriff's offices in Colorado.

We also came to the determination that BSAR is an essential service. Similar to fire, EMS, and other emergency services, BSAR is vital to the health and wellbeing of both residents and visitors. This has been very evident during the pandemic when backcountry use skyrocketed from people seeking an escape and solace. Additionally, BSAR teams respond to more than just recreation incidents, such as plane crashes, statewide disasters, and at-risk individual searches. However, BSAR is well behind those other emergency services in terms of financial and legal support.

There are recommendations below to identify paid staff support in a few key areas, as well as a leading agency/group to convene BSAR stakeholders to discuss particular issues in more detail. Most, if not all of these duties should be fulfilled by the state in partnership with other stakeholders in the BSAR working group, including the Colorado Search and Rescue Association (CSAR). We recommend that these partners sit down and map out the roles and responsibilities as to which recommendations each partner will lead. Further, some issues such as the State SAR Coordinators may warrant written documentation and formalized roles and responsibilities.

Findings

Below is a summary of each study topic, including key issues and top recommendations. The study team went to great lengths to accurately portray the complexities of the BSAR system in the Introduction chapter and provide a layperson's overview of each study topic throughout the report. It is recommended that you study these resources if the issues and recommendations in this executive summary are unclear or perplexing:

Coordination Structure

The study team was asked to “improve and develop a sustainable structure for coordination” among BSAR partners. With some exceptions, the study team heard that the coordination works remarkably well for BSAR considering the complexity of BSAR relationships within the whole system (see Figure 2 on Page 20). The decentralized model, where county sheriffs and their BSAR teams can handle BSAR the way they see fit with full consideration for unique local challenges, is of value to the BSAR community as a whole. As one BSAR volunteer stated: “Don't change much right now as we have some of the best BSAR available in the world.”

Top Recommendations

- **Strategically increase the use of helicopters** - Helicopters are force multipliers and consideration should be given to strategically increasing their use to improve BSAR incident response efficiency and effectiveness. BSAR leaders should consider the value and cost to have a helicopter dedicated to BSAR needs, and have a conclusion by no later than December 1, 2022.
- **Improve field communications** - Provide sheriffs and BSAR teams funding to purchase, program, and maintain communications equipment to improve communication technologies and capabilities between sheriffs and BSAR teams. Have a paid staff person collect additional information on specific radio and satellite communication needs by December 1, 2022.

Workers' Compensation

Gaps in workers' compensation can weigh heavily on teams and deter sheriffs from providing out-of-county assistance. Taking immediate steps to ensure that coverage is provided through the state and its partners will enable teams to focus on other challenges.

Top Recommendation

- **Pursue a single coverage option:** CSAR, the County Sheriffs of Colorado (CSOC), and the state should approach Pinnacle Assurance and County Technical Services, Inc. (CTSI) to discuss what a single coverage option could look like for BSAR teams and have a conclusion no later than December 1, 2022.

Retirement

Currently, there are no retirement benefits available to Colorado's BSAR volunteers outside of what an individual may have through their work or personal savings. Pension programs (retirement) for firefighters were created to help recruit and retain volunteers, but their effectiveness is uncertain. When asked to rank the importance of seven benefits for their continued participation in BSAR activities, retirement benefits for their BSAR work ranked the lowest. The study team recommends that no action be taken at this time.

Compensation and Reimbursement

Survey results showed that the average volunteer contributes \$1,587 of their own money each year for items like gear, fuel, and training courses. Using best estimates for the number of BSAR volunteers in the state (2,800), volunteers contribute more than \$4.4 million of their own money, per year, to BSAR.

Top Recommendation

- **Retain the gear reimbursement aspects of the Search and Rescue (SAR) Fund** - The current model that the SAR Fund has for reimbursing personal gear damage and loss works reasonably well.
- **Offer mileage reimbursement or a stipend** - Consider giving volunteers mileage reimbursement or a stipend, and discuss implementation options with BSAR leaders. Putting \$1 Million to this use would cover approximately 40% of volunteers' personal mileage costs per year.

Equipment

BSAR is gear intensive and team equipment is expensive to purchase and maintain, as it must be strong, lightweight, and robust enough for multiple uses in austere settings. Having the right equipment for the job makes operations safer and more efficient for the rescue subjects and the BSAR volunteer responders. Survey results showed that nearly half of the BSAR teams felt that they had less than enough gear to complete their BSAR mission. Even though BSAR members often receive discounts on gear, it is still difficult to find funding for it.

Top Recommendation

- **Retain some team equipment purchasing aspects of the SAR Fund** - While it shouldn't be a large proportion of the fund, allowing equipment purchases is an

important use of the SAR fund for some teams, especially those that face local fundraising and donation challenges.

Funding

For the important services that BSAR teams provide, they get by with very little. Large teams have yearly expenses over \$200K while small teams may operate with less than \$10K. When considering BSAR services directly enable the successes seen in Colorado's outdoor recreation economy (estimated at \$62.5 billion⁴), it is clear there are major funding disparities. Currently, funding for BSAR teams often comes from a few main sources depending on the team: their sheriff's office, donations/contributions, and the state's SAR Fund. Additionally, the value of direct costs and donated time from volunteers is estimated at \$21 million annually.

Top Recommendations

- **Move the SAR Fund to Colorado Parks and Wildlife (CPW)** - The study team recommends that CPW administer the SAR Fund going forward for a few reasons, but mainly to enable more money to be able to go to BSAR teams through CPW's enterprise status.
- **Seek additional state funding** - In order to adequately fund key recommendations in this report, additional state funding should be identified to support BSAR teams.
- **Continue engaging other partners** - Many who benefit from BSAR, such as the outdoor recreation industry and many backcountry users, are not paying in to support BSAR teams and volunteers.
- **Hire a Development Manager** - CSAR should hire a Development Manager to map out funding strategies such as corporate fundraising, membership giving programs, and grant assistance to BSAR teams.

Physical and Psychological Support

BSAR professionals (both unpaid volunteers and paid agency staff) are exposed to traumatic events regularly, leading to increased risk of adverse mental and physical health outcomes, secondary traumatic stress (STS), burnout, and stress injuries. There is currently not enough support in the system to prevent and address these challenges.

Top Recommendations:

- **Plan for needed mental health services and incident support practices** with input from all stakeholders,
- **Train BSAR professionals** through continued prevention education on awareness, mitigation, and critical incident support, e.g. using the Responder Alliance curriculum. It would take an estimated \$250K per year to train one-third of the BSAR volunteers.
- **Coordinate clinical services** from community mental health providers who could be contracted and trained to address the unique mental health needs of BSAR professionals through a "centralized coordinating center", such as the successful hub-and-spoke program in SB 19-001 at the University of Colorado. This would cost approximately \$350-400K per year, including the cost of the coordinating center, peer support coordination and allocated funding for utilization of local services.

⁴ 2019 Statewide Comprehensive Outdoor Recreation Plan:
<https://cpw.state.co.us/Documents/Trails/SCORP/Final-Plan/2019-SCORP-Report.pdf>

Governmental Immunity

While BSAR volunteers have some immunity protections depending on the facts of a particular situation, there are clear gaps in these protections. BSAR volunteers participate in a wide variety of essential activities, such as fundraising, maintenance, training, and incident response, that may or may not fall under the direction of their sheriff when additional protections are usually granted. The study team found a few potential legislative improvements to provide BSAR volunteers and their teams additional protections.

Top Recommendation

- **Improve immunity protections through legislation**, such as expanding and explicitly stating that BSAR volunteers and their affiliated organizations (teams) are included in the protections of *C.R.S. §13-21-113.7*.

Training

In general, leaders on Colorado's BSAR team rated the quality of the training their team receives as "good." However, there were appreciable differences between large and small teams where large teams tended to rate the quality as higher than small teams. When asked why current training was inadequate, the most frequent responses from BSAR leaders dealt with available time. Also, high on the list was the lack of expertise and available trainers.

Top Recommendations

- **Host a BSAR Credentialing/Training Summit** - BSAR leaders should convene to discuss the potential for a new credentialing/training program for Colorado BSAR by no later than December 1, 2022.

Public Outdoor Safety Education

Only about 30% of BSAR volunteers and sheriffs say that public outdoor safety education is "good" or better. Public education challenges for BSAR are similar to other recreation partners: getting and keeping the public's attention, limited time and capacity, less prevalence and use of mentors over time, and low participation at free public training. Continued messaging and collaboration with partners will help to boost creative strategies and reach larger audiences.

Top Recommendations

- **Develop public-facing decision-making aids** - The state could work with CSAR to develop an online guide/aid, similar to AdventureSmart⁵, that will give detailed information on how to make smarter backcountry decisions.
- **Develop plug-n-play marketing toolkits** - The state could fund or provide staff to create a free statewide toolbox of premade professional Preventative Search and Rescue (PSAR) education materials, with messaging, graphics, and videos that are applicable to anywhere in the state.

⁵ <https://www.adventuresmart.ca/>

Additional topics added by the study team:

BSAR Team Planning and Administration

Two important related issues were identified through stakeholder interviews and volunteer surveys. One, BSAR teams are often operating without a strategic plan to address their local BSAR needs. This leads to reactionary decision-making and weakens many team functions, such as grant requests and team recruitment strategies. Two, BSAR volunteers are struggling to stay on top of administrative functions like reporting and budgeting. This is a concern raised by many teams and it has impacts on volunteer retention.

Top Recommendations

- **Provide centralized administrative support** - Leadership from BSAR partners (CSAR, CSOC, and relevant state agencies) should convene to identify which agency or group is best to provide support in key planning and administrative areas for BSAR teams. This should be done by no later than December 1, 2022.

State SAR Coordinators

State SAR Coordinators, currently being filled by CSAR volunteers, have an immense amount of delegated authority and responsibility and receive no financial support for their efforts.

Top Recommendations

- **Provide cell phone plan reimbursements** - At a minimum, the State SAR Coordinators should be eligible for cell phone plan reimbursement. It would cost about \$21,600/year to cover all of the coordinators.
- **Establish a program coordinator** - Find a way to pay for at least one full-time employee either at CSAR or at a state agency to coordinate and support these volunteer positions.

Data Collection and Reporting

Generally, data is collected and used by search and rescue partners for three main purposes: preparation, response, and evaluation. Across the state, many different platforms are used for these purposes and inconsistency leads to patchy reporting and an inability to use data effectively.

Top Recommendations

- **Host a BSAR Data Summit** - BSAR partners should host a summit to discuss which data is most important to collect, how to define each data item, and what format each should be in. This should be completed by no later than December 1, 2022.
- **Hire a Data Analyst** - The state should fund a BSAR data analyst to improve data accountability, consistency, and analysis of trends to better identify potential system improvements and more effective prevention measures, such as site-specific signage.

Other Benefits

The study team came across other benefits and coverages that are important for BSAR teams and volunteers. These include survivor death, disability, and education benefits, and additional helpful coverages such as directors and officers insurance.

Top Recommendations

- **Compile all relevant benefit and insurance information related to BSAR in one place** - Hire a person at CSAR to complete this task by no later than December 1, 2022.
- **Add BSAR to the Survivor Education Benefit** - The state should consider adding BSAR volunteers to the state postsecondary education benefit for dependents in *C.R.S. §23-3.3-205*.

Conclusion

Colorado is a national leader when it comes to BSAR, and its services are key to the health and success of Colorado's outdoor recreation and tourism industries. Through strong partnerships across public, private, and military sectors, BSAR partners risk their lives to save others and do so with pride and honor.

Considering all of the significant challenges that BSAR faces, the study team did not find a need to recommend dramatic changes to the current BSAR system. Rather, the best path forward is to develop new and innovative ways to support and allow the volunteer responders to continue to serve their local communities and all of Colorado. If swift and strong measures are taken to reinforce BSAR today, we can ensure that these essential services sustain and continue to be available to anyone who visits Colorado's backcountry.

INTRODUCTION

Background

Colorado is a national leader when it comes to Backcountry Search and Rescue (BSAR). It has highly specialized teams that operate under the direction of, and in coordination with, county sheriffs across the state. By providing this vital service, BSAR is key to the health and success of Colorado's outdoor recreation and tourism industries. Using state-of-the-art technology and strong partnerships across public, private, and military sectors, BSAR partners risk their lives to save others and do so with pride and honor.

However, with increasing recreation use statewide and evolving challenges, the BSAR system is being tested and strained. County sheriffs are increasingly depending on BSAR teams that are struggling with membership challenges, limited availability, legal protections, and other considerations. BSAR volunteers are being stretched to their limits across many categories, and are at risk of burning out. Core funding only comes from a handful of recreation user classes and has largely remained stagnant through the years. If left unaddressed, any one of these issues could result in a breakdown of the BSAR system in Colorado - a service that is vital to the health and safety of both residents and visitors.

Through the passing of Senate Bill (SB) 21-245, Colorado Parks and Wildlife was directed to study and address ten topics related to Backcountry Search and Rescue (BSAR): coordination, workers' compensation, retirement, compensation and reimbursement, equipment, funding, physical and psychological support and resources, governmental immunity, training, and public outdoor safety education (full bill language for each topic can be found in APPENDIX A). The purpose of the study is to better understand, in a holistic sense, the successes and challenges of BSAR, both now and into the future. This charge is an exciting opportunity to be proactive and look to the future, when increasing workloads often force BSAR partners to be reactive only. To our knowledge, this comprehensive study of a state BSAR system is the first of its kind in the nation.

What is BSAR?

Backcountry Search and Rescue (BSAR) means the employment, coordination, and utilization of available resources and personnel in locating, relieving distress and preserving life of, and removing survivors and recovering bodies from the site of a emergency or disaster in the forests, deserts, mountains, canyons, caves, waters, parks, plains, and, at times, in more populated areas to a place of safety in case of lost, stranded, entrapped, or injured persons⁶. While it is mainly focused on recreationists, it also includes motor vehicle accidents, avalanches that impact homes, wanderers (e.g., dementia and Alzheimer walkaways), accidents involving outdoor-workers (e.g., geologists, surveyors, lineworkers, prospectors, etc.) and aviation accidents. Essentially, if a person is lost anywhere or injured beyond the typical reach of street-based emergency services, backcountry search and rescue teams safely provide the specialized services necessary to resolve the situation.

⁶ *The above definition is an amalgamation of the definition of Backcountry Search and Rescue from C.R.S. §33-1-102(1.3) which is a subset of Search and Rescue as defined in C.R.S. §24-33.5-703(8)*

BSAR History

Formal BSAR operations started in Colorado shortly after WWII when the first mountain rescue team formed in 1947. Across the state, returning service members, using inexpensive but rugged surplus gear driving reliable automobiles fueled with inexpensive gas, started the first boom in backcountry recreation. As outdoor recreation and the state's population continued to grow, more teams formed. Today, approximately 50 BSAR teams with about 2,800 volunteer members respond to nearly 3000 incidents a year. For more than 70 years BSAR teams have worked collaboratively with their local sheriffs to rescue people, recover bodies in the backcountry, and educate the public to prevent accidents.

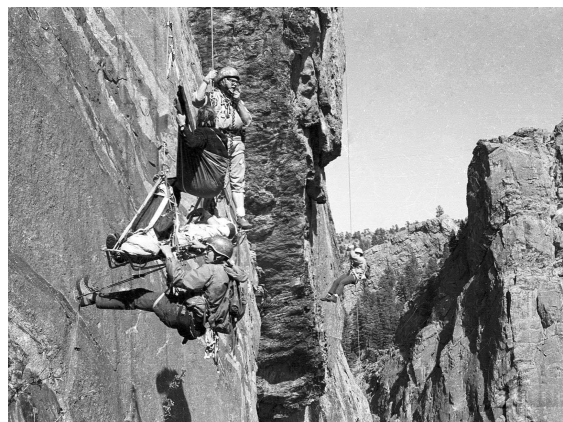


Photo credit: Rocky Mountain Rescue Group Inc.

How does BSAR generally work?

Backcountry search and rescue always begins with a “call” - either directly from the person(s) needing assistance or someone else on their behalf. This is often directed to 911 first, and is then routed to the county sheriff and other partners. Similar to most states in the mountain west, county sheriffs have statutory authority over BSAR operations in Colorado. BSAR volunteer teams (groups of unpaid professionals) exist in most counties across the state and assist their sheriff with BSAR operations. As BSAR incidents become more complex, the Colorado Search and Rescue Association (CSAR) steps in to assist with the procurement of additional resources, and to play coordinating and advising roles in the incidents. Lastly, on rare occasions, BSAR Volunteer teams may be deployed in declared disasters where CSAR works in coordination with the Division of Homeland Security and Emergency Management (DHSEM).

In BSAR, there are a substantial number of variables (time, location, weather, level of injury, etc.) that influence a response. At times, additional partners such as the Colorado Army National Guard, the Division of Fire Prevention and Control, and air ambulances such as Flight For Life are called to assist with search and rescue operations. At other times, the “call” for help comes from somewhere outside of 911. For example, personal locator beacons (PLBs) that the public uses to call for help via satellite are routed differently through the BSAR system - international-government SARSAT satellites, Air Force, CSAR, and then the sheriff. Similarly, Satellite Emergency Notification Devices (SENDs), such as Spot, Garmin, Zoleo, etc., use commercial satellite systems and a commercial communication center to pass along an alert to the appropriate sheriff, and then to the local BSAR team.

Above all, it is a pillar of the United States search and rescue community that rescues should be free, and this is the case here in Colorado. It should be noted that while BSAR rescues are free, medical care provided by local EMS or air ambulance services will likely incur charges. Rescue teams (sheriffs and volunteers) are trained to know when costs will be incurred and will advocate for the person(s) being rescued.

Study Methodology

The study team used main methods to collect information to identify BSAR challenges and potential solutions:

Surveys - Two separate surveys were conducted to collect important baseline data from key BSAR partners:

BSAR Volunteers - A survey designed for BSAR volunteers was sent to more than 50 non-profit BSAR teams across Colorado. The survey asked questions to better understand each of the ten topics that the study was asked to address. There were additional questions focused on team- and system-level challenges that were presented to self-identified BSAR leaders. In total, the survey consisted of 154 questions and included various validated instruments to assess demographics, experiences, and mental health outcomes, including depression, substance use disorder, post-traumatic stress disorder, chronic stress, and burnout.

Responses were received from 657 volunteers from across 49 teams, with 249 of those being volunteer leaders. A complete list of teams that responded can be referenced in APPENDIX C. Responses were well distributed around the state. Using the CPW's four regions (Figure 2, at right), 26.6% were from the NW, 27.0% were from the NE, 19.7% were from the SE, 25.9% were from the SW, and 1.7% were from a statewide team. More summary statistics and analysis can be found throughout this report.

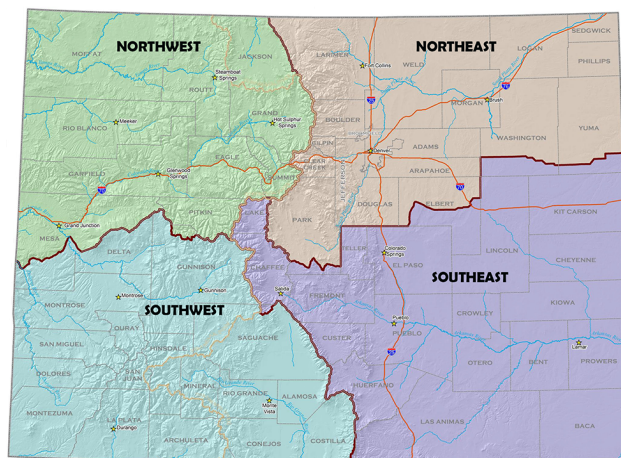


Figure 2 - CPW Regions Map

County Sheriffs - A survey designed for county sheriffs was sent to all 62 elected sheriff's offices, the Broomfield Police Department, and the City and County of Denver Sheriff's Department in Colorado via the County Sheriffs of Colorado (CSOC) listserv. Forty-one sheriff's offices (predominantly from counties that have BSAR operations) responded to the survey. The full list can be found in APPENDIX D. More summary statistics and analysis can be found throughout the report.

Interviews - The study team interviewed a wide variety of partners and subject matter experts during the course of this study. A full list can be found in the ACKNOWLEDGEMENTS section above.

Independent Research - Utilizing subject matter expertise brought by the study team, additional research was conducted to better understand BSAR issues in addition to identifying solutions and new approaches to specific challenges.

BSAR Workgroup - A workgroup composed of BSAR leaders and stakeholder representatives met with the study team on a biweekly basis through the study period to provide feedback and stay up-to-date on the study process. Additionally, on October 25th, 2021, many workgroup members participated in a BSAR Summit to provide direction to the study and better define what a sustainable BSAR model looks like. You can read the Summit Takeaways in APPENDIX B.

Who is the typical BSAR volunteer?

Based on survey results, the average volunteer is a 47 year-old, white, male, who holds a Bachelor's degree or higher, has been involved in BSAR for about 10 years, and gives 50 days of volunteer service per year. Interestingly, many of the BSAR volunteers are those who had a friend, loved one, or they themselves needed BSAR services at one point. The table below is a summary of all demographic categories:

Table 1 - Survey Demographic Summary

BSAR Volunteers - Leaders	Demographics	BSAR Volunteers - Regulars
50 (50)	Age mean (median)	46 (45)
83.5% 15.7% 0.8%	Gender Man Woman Other	68.3% 30.4% 1.3%
93.8% 0.4% 5.8%	Race White African Am. Other	94.5% 0.2% 5.2%
14.5 (11)	Years of Service mean (median)	7.7 (4)
76.2%	Education Bachelor's or higher	75.8%
249	Total Responses	402

Diversity within BSAR Teams

As can be gleaned from the demographic summary table (Table 1, above), the BSAR volunteer community, as a whole, is very homogeneous. Knowing that BSAR team members have a high level of experience and comfort in Colorado's backcountry, as well as lots of free time and expensive professional gear to use in BSAR, there are many potential barriers to becoming a BSAR volunteer.

Generally speaking, advocates for diversity in the outdoors put addressing challenges and removing access barriers as the top strategies towards improving diversity in the outdoors. While BSAR teams may have limited capacity to support these larger efforts, there is still plenty to do, right now, in order to create a more welcoming culture for diverse members to join their teams in the future and to improve their BSAR services to the public. A logical place to start would be to integrate topics such as unconscious bias into BSAR training, ensuring that current BSAR volunteers have a common level of understanding of foundational issues related to

diversity, equity, and inclusion. The study team was happy to hear that there have been diversity improvements over the years, mainly in the categories of age and gender. While the study team didn't have enough time to fully address the topics of diversity, equity, and inclusion in this report, it's recommended that there is an intentional effort to study and address these issues in the BSAR community.

Use of BSAR vs SAR in this report

Backcountry search and rescue (BSAR)⁷ is a subset of search and rescue (SAR)⁸. While the bill directed the study to focus on Backcountry Search and Rescue (BSAR), sometimes Search and Rescue (SAR) is used to accurately describe aspects of the current BSAR system, such as the SAR Fund through the Department of Local Affairs.

Definitions

Backcountry Search and Rescue (BSAR) - the employment, coordination, and utilization of available resources and personnel in locating, relieving distress and preserving life of, and removing survivors from the site of an emergency or disaster in the forests, deserts, mountains, canyons, caves, waters, parks, plains, and, at times, in more populated areas to a place of safety in case of lost, stranded, entrapped, or injured persons.

BSAR partners - Sheriffs, non-profit teams, and relevant non-profit, for-profit, local, state and federal entities.

BSAR teams - Volunteer backcountry search and rescue teams (often non-profits) across the state that work under the direction of their county's sheriff. These include standalone non-profit teams, sheriff's affiliated teams or programs, and specialty teams like mine and cave rescue.

BSAR volunteers - Unpaid professionals who volunteer on BSAR teams.

BSAR professionals - A term used to describe both BSAR volunteers and paid staff often included in BSAR responses, such as sheriffs, their deputies, state employees, and other first responders.

BSAR providers/clinicians- Health care and mental health providers with specialized training to meet the needs of BSAR professionals.

Incidents - Are both an occurrence, natural or human-caused, that requires a response to protect life or property, and incidents are the specific operation (aka "response") that a group is charged to conduct. Incidents are sometimes still referred to as "missions", but there is an intentional push to use "incidents" going forward to better align with other emergency services and systems like Incident Command (IC), leading the study team to use "incident" most often in this report.

Mutual-Aid - An agreement among emergency responders to lend assistance across jurisdictional lines. The request may occur due to an incident or emergency that exceeds the local resources, such as a disaster, multiple-alarm fire or a law enforcement incident that requires immediate action and a multiple officer response. Mutual-aid may be ad hoc, requested only when the need arises. It may also be a formal standing agreement for cooperative emergency management on a continuing basis.

⁷ As defined in C.R.S. §33-1-102(1.3)

⁸ As defined in C.R.S. §24-33.5-703 (8)

Stress Injury - Stress injuries describe a broad range of psychological and other conditions resulting from duties performed on the job that interferes with a person's professional and personal life, including anxiety, depression, and post-traumatic stress disorder. Also referred to as an occupational stress injury (OSI).

Subjects - The person(s) being searched for, rescued, or recovered in a BSAR incident.

BSAR Partners List

Below is a list of partners and their normal duties for BSAR responses:

- **BSAR Team** - A volunteer professional rescuer team that's often a non-profit entity. Typically, BSAR teams operate within one county but may respond to other counties, if requested.
- **City and County Park Rangers** – On local government lands, park rangers provide public safety, natural resource protection, share environmental education, and work jointly with BSAR teams to manage SAR incidents.
- **Civil Air Patrol (CAP)** - A non-profit auxiliary unit of and wholly funded by the United States Air Force. CAP is the lead agency when searching for missing aircraft; however, once search efforts shift to the ground, the sheriff has authority. At the invitation of the sheriff, the CAP may participate in ground search missions.
- **Colorado Army National Guard (COARNG)** – National Guard aircrews and helicopters are used to move numerous rescuers and equipment during BSAR operations when other helicopters are unavailable. COARNG also partners with four Colorado Mountain Rescue Association Teams and CSAR to create the Colorado Hoist Rescue Team (CHRT). CHRT is deployed about 24 times a year; however, by military regulations, it cannot be used for body recoveries.
- **Colorado Avalanche Information Center (CAIC)** - A program within the Colorado Department of Natural Resources, the CAIC provides information, education, and research for the protection of life and property. In an effort to produce better forecasts and educational information, CAIC staff investigate all serious avalanche accidents, so they interact with BSAR teams during and after SAR operations. CAIC staff provide direct support to BSAR operations through weather and avalanche forecasts and field support upon request. Field support is mostly provided to counties with fewer resources or resources without avalanche experience.
- **Colorado Division of Fire, Prevention, and Control (DFPC)** – While the department's primary mission is fire, they have airplanes and helicopters that are occasionally used in BSAR. Their two high-performance multi-mission aircraft (airplanes) are equipped with state-of-the-art infra-red and optical sensors that can be used in searches. The program also has two helicopters available from April through November that can assist BSAR teams when available.
- **Colorado Division of Homeland Security and Emergency Management (DHSEM)** - They are responsible for assistance and coordination during large disaster responses and recovery such as wildland fire, floods, and hazardous material incidents. Currently, they delegate authority to the State SAR Coordinators to CSAR.
- **Colorado Parks and Wildlife (CPW) Park Rangers and Wildlife Officers** - State park rangers and wildlife officers provide public safety, natural resource protection and administrative management of state lands. Because CPW staff are distributed across the state, they sometimes provide assistance to BSAR as needed.
- **Colorado Search and Rescue Association (CSAR)** - A volunteer, non-profit, 501(c)(3) membership association representing the backcountry search and rescue community in

Colorado. They provide SAR State Coordinator services through MOUs, involvement in requesting state and federal assets, and looping-in neighboring teams when requested by the sheriff with jurisdictional authority. CSAR also assists in training and preparing volunteers to respond to BSAR incidents.

- **County Emergency Managers** – At the county level, emergency managers plan, coordinate and support a wide range of activities to help the county prepare for, respond to, and recover from disasters and large-scale emergencies. Also, part of their planning and preparation efforts involve reducing vulnerabilities to hazards. Typically, county emergency managers are not involved in BSAR incidents but may be called upon for logistical assistance in large BSAR incidents.
- **County Sheriff** - An elected official who has statutory authority (an unfunded mandate) over BSAR responses in their county.
- **County Sheriff Posse/Reserve** - A volunteer team the sheriff can use for any county need. In some counties, they provide BSAR services.
- **Emergency Medical Services (EMS)** – Also known as ambulance services provide pre-hospital treatment and transportation to hospitals. Some BSAR teams have formal programs with their local EMS providers for EMS paramedics to assist in the field when advanced levels of care are required.
- **Fire Protection Districts** – Fire districts (and departments) are responsible for fighting fires and also have statutory authority to also provide EMS/ambulance services, rescue and dive-rescue services. Fire districts may provide some BSAR service in the wildland-urban interface (WUI) zones of their district when distances are very close to a road and access is very easy.
- **Helicopter Emergency Medical Services (HEMS)** - These private air ambulance services provide rapid, very advanced pre-hospital care along with speedy transportation to and from remote locations. Flight For Life Colorado has been a leader in working with local and special-trained BSAR members to provide faster responses to backcountry emergencies. The small aircraft can carry only one or two BSAR rescuers and little additional equipment.
- **National Parks Service (NPS)** - A few parks have exclusive jurisdictional authority where the park staff handle their own BSAR operations. Any park, however, can call on neighboring sheriffs to request local BSAR teams.
- **SAR State Coordinator** - A highly trained professional volunteer who is on-call for lengthy periods to assist with incidents, especially with remotely advising local incident commanders and securing outside resources such as additional BSAR teams, state and federal aircraft. State SAR Coordinators also work directly with the Air Force Rescue Coordination Center regarding PLB activations, downed aircraft, and cell-phone forensics, activating the Colorado Hoist Rescue Team. Coordinators also work directly to secure local resources, e.g., side-scanning sonar for underwater search, cave and mine rescue, and on occasion, coordinators will travel to incidents to assist the incident management team.
- **Ski Patrols** - Both volunteer and paid ski patrols are sometimes called upon by the local sheriff to perform or assist in avalanche SAR and other winter rescues.
- **United States Forest Service (USFS) & Bureau of Land Management (BLM)** - These agencies manage federal public lands and share a common mission that the lands will meet the needs of present and future generations. As to search and rescue, both agencies do not necessarily perform BSAR but are to provide assistance as needed.

About the recommendations made in this study

This study endeavored to cover a wide variety of topics, each with its own complexities and nuances. With a tight timeline of less than 4 months, the study team focused first on accurately identifying the challenges across the ten issue areas outlined in SB 21-245. As time allowed and issue complexity was considered, some specific strategies to address the identified challenges were recommended. Other issues will require further discussion, studies, and input from BSAR leaders and subject matter experts in order to better define potential improvements and/or new approaches. As noted in the Conclusion section at the end of this report, continued consultation with affected BSAR partners will be vital to the creation of solutions that best address the current and future needs of the entire BSAR system.



Photo credit: Mesa County Technical Rescue Team

CHAPTER 1 - COORDINATION STRUCTURE

Effective and efficient BSAR boils down to:

“Getting the right resources, to the right place, at the right time.” -BSAR volunteer

This chapter will address the sustainable coordination of partners to efficiently and effectively respond to changing BSAR needs across the state. It is broken into three sections, Partner Coordination, BSAR Team Planning and Administration, and State SAR Coordinators. Below is the specific bill study chapter that will be covered:

(1) HOW TO IMPROVE AND DEVELOP A SUSTAINABLE STRUCTURE FOR COORDINATION AMONG THE STATE OF COLORADO, COUNTY SHERIFFS AND LOCAL LAW ENFORCEMENT AGENCIES, PUBLIC OR NONPROFIT ORGANIZATIONS THAT PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, AND FEDERAL AGENCIES;

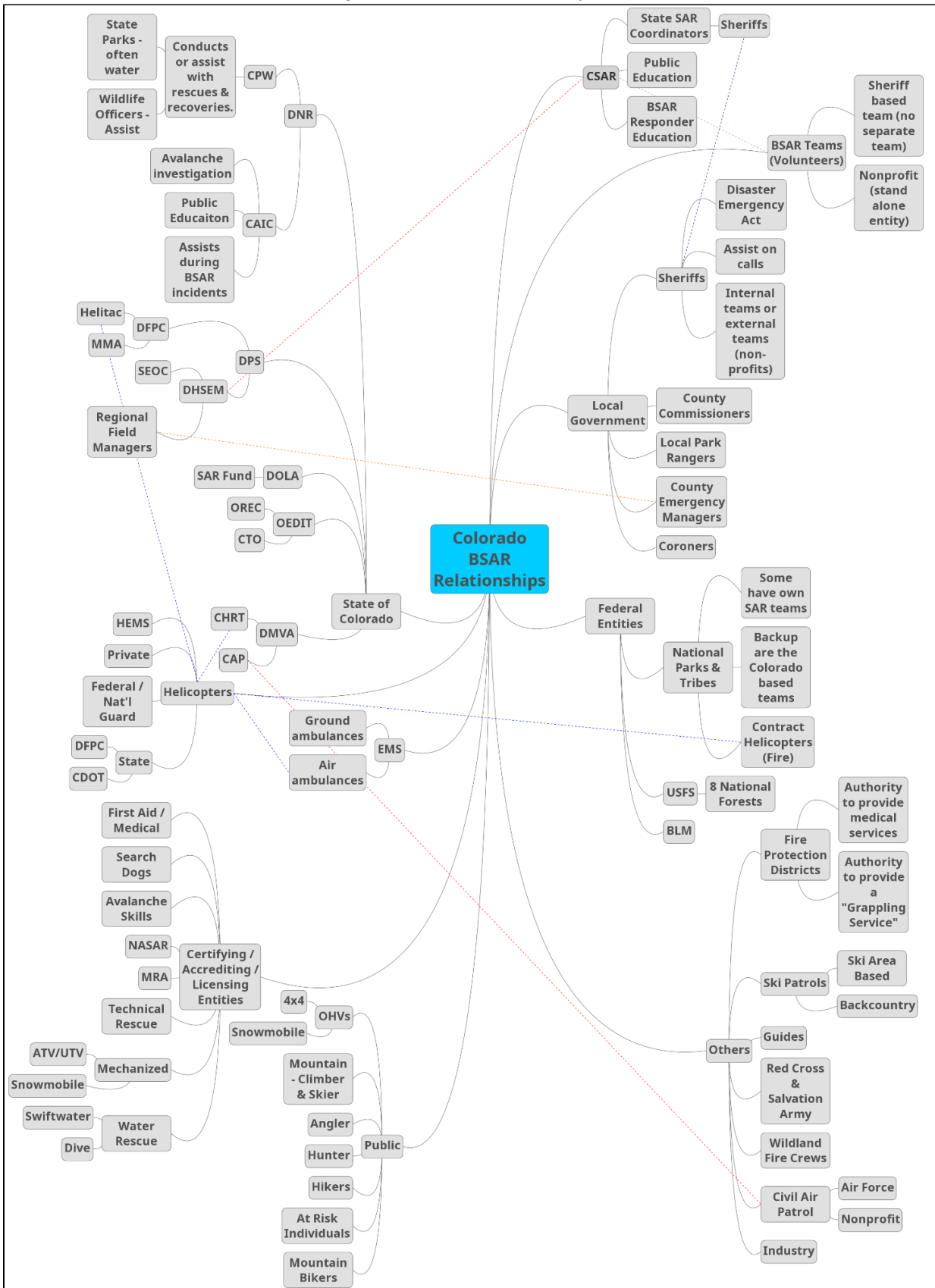
PARTNER COORDINATION

Situation:

In the State of Colorado, the duty to coordinate search and rescue is the responsibility of the sheriff of each county. C.R.S. § 24-33.5-707(10). Each sheriff coordinates BSAR in their own unique way. Most counties use a single volunteer backcountry search and rescue team. Some delegate almost all of this duty to these BSAR teams; some have paid sheriff positions overseeing BSAR; and others combine fire, EMS, and BSAR teams to carry out search, rescue, and recovery incidents ([source](#)).

In addition to these core partners, an amazing complex web of partnerships gives the BSAR system support from a wide variety of public, private, and military sectors. See Figure 2 (below) for a depiction of this web of partnerships and the BSAR Partners List above for the normal duties of key BSAR partners.

Figure 2 - BSAR Relationships



Memorandums of Understanding (MOUs), Intergovernmental Agreements (IGAs), and other agreements enable this complex system to function under the local-control model of sheriff authority. This includes agreements between:

- **BSAR teams and sheriff's offices (or county)** that set parameters as to the roles and responsibilities of both parties, including operating guidelines and authority to represent the county. Most BSAR teams have MOUs with their sheriffs but not all.
- **Federal land managers and sheriff's offices/BSAR teams** that specify the responsibilities and conditions for performing and the reporting of SAR activities, and for the use of motorized vehicles and mechanized equipment in Wilderness areas. Some teams may have special use permits to conduct training on federal lands.
- **CSAR and federal agencies** that give CSAR authority to call up federal assets
- **CSAR and DHSEM** that allows CSAR to provide SAR State Coordinator services
- **Colorado and other states** formally share SAR resources through the national Emergency Management Assistance Compact (EMAC), which is done through states' DHSEM. The process is a paradox in the world of BSAR. Colorado BSAR volunteers deployed to other states enjoy all the desired benefits – workers' compensation insurance, immunity, reimbursement, etc. – by going to another state, but those same benefits are not provided to in-state BSAR volunteers. Likewise, out-of-state BSAR volunteers deployed to Colorado enjoy all those same benefits even though the benefits are not available to Colorado's in-state BSAR volunteers. This paradox is not a source of frustration ONLY because the EMAC process is virtually unknown to Colorado BSAR volunteers. Informally, a number of Colorado BSAR teams occasionally work across the state line with an adjacent county. It is unknown what agreements are in place at the local level.
- **Local land managers (city parks and county open space) and the BSAR team** that typically set the conditions for training on parks and open space land.

How do stakeholders feel about the current structure?

We asked BSAR partners about their opinions on the current BSAR structure. Below are two summary data tables from the BSAR survey:

Table 2 - How well does the current model of BSAR coordination in Colorado work WITHIN YOUR STANDARD RESPONSE AREA?

BSAR Leaders	WITHIN YOUR STANDARD RESPONSE AREA	Sheriffs
18.0%	Very Well	40.0%
38.1%	Well	30.0%
36.5%	Acceptably	22.5%
5.8%	Poorly	2.5%
1.6%	Very Poorly	5.0%

Table 3 - How well does the current model of BSAR coordination in Colorado work OUTSIDE YOUR STANDARD RESPONSE AREA?

BSAR Leaders	OUTSIDE YOUR STANDARD RESPONSE AREA	Sheriffs
6.4%	Very Well	19.4%
25.0%	Well	38.9%
60.1%	Acceptably	41.7%
8.0%	Poorly	0.0%
0.5%	Very Poorly	0.0%

Based on survey data, most partners feel the coordination model works relatively well right now. BSAR leaders cited leadership from CSAR, sheriffs, and State SAR Coordinators for the high functioning of the current coordination system: “CSAR has really lead the way across the nation for making this a more sustainable resource across the state.”, “The sheriff is a unifying force ensuring that agencies work together well.”, “Coordinators are knowledgeable and experienced SAR persons.” Additionally, BSAR teams championed the value of helping out neighbors for increased BSAR system operability: “We work closely with our neighbors and are planning future training with these teams, in order to forge those bonds and skills.”

Sheriffs see success in the current BSAR model through the partnership and support from their local teams: “I am very fortunate to have a well trained and cohesive SAR Team with excellent leadership and the knowledge and skills to respond to most missions. The communication between my SAR Team Leadership and I is very good and we have developed a high degree of trust between us”, “We have 1850 square miles and limited resources. Having access to several dozen volunteers is priceless.” Sheriff’s also valued mutual-aid agreements and memorandums of understandings (MOUs) that better enable assistance from neighboring counties and BSAR teams.

While there are more successes than challenges when it comes to coordination, there is certainly still room for improvement. We heard from BSAR leaders that consistency in a few systems could improve coordination, such as a statewide dispatch system for special resources like dog teams, support for teams to have radios that operate on 800 mhz channels, consistent electronic mapping for search management, and arranging travel/lodging. There are also, at times, personal issues with local fire rescue departments related to different opinions and practices related to mission management. Lastly, the national Mountain Rescue Association (MRA) team accreditations that about 15 high caliber teams in Colorado have, causes confusion and a sense of being left out for the teams that can’t achieve this accreditation.

Coordination challenges from the sheriffs mostly align with the BSAR leaders’. A lack of radios and general communication limitations by terrain was a top issue. Some strained relationships between fire, EMS, and the SAR teams warrant mediation. Issues around inconsistent response from SAR teams, especially during weekdays, were a challenge for some sheriffs.

Considerations:

Through interviews, research, and professional expertise, the study found additional relevant considerations that impact the current coordination model for BSAR. First off, it's important to realize that all teams aren't experts across all rescue categories or in all terrain types, and this inconsistency is a challenge when calling on neighboring teams to assist with large and complex incidents. Additionally, staff and volunteer turnover is an issue across the state, in a system where personal connections help improve coordination during incidents, high turnover rates also harm safety, shrink institutional knowledge, and affect community perceptions. Turnover at the federal level can also impact the BSAR philosophy of federal partners. These turnovers and shifts can affect training, safety, mentoring, local geographic knowledge, community involvement, and a host of other factors as well.

As BSAR needs expand, especially in rural areas, fire departments may become more involved in BSAR activities (despite challenges related to competing priorities and overlapping mission concerns (dealing with fires above BSAR calls). Colorado's 310 registered fire departments⁹ outnumber BSAR teams 6 to 1. It is unsure how this will play out across the state. These fire teams often have better funding than BSAR teams, but they deal with the same, if not greater, recruitment and retention challenges.

Helicopter use is essential for certain types of rescues, and their use can help to increase the capacity of BSAR teams in light of staffing and other challenges. Compared to 37 other states that have statewide, county, or large-city aviation programs, Colorado lags behind in the use of dedicated helicopters for BSAR. Helicopters are force multipliers enabling more work to be done faster and by fewer people. For BSAR, most often the State SAR Coordinators call in requests for helicopter use, such as COARNG, and provide a critical role in vetting requests to ensure appropriate use. It's important to note, however, that helicopter use may diminish the spirits of the volunteers and their perceived value in the BSAR system. This can be partially addressed by clearly acknowledging that helicopters do not replace the need for volunteers; rather, helicopters make volunteers more effective.

Concerns were raised about the lack of planning for BSAR with new recreation infrastructure, especially long remote trails and ones that lead into dangerous terrain. Even at a national level, BSAR has not been considered in future recreational planning on federal lands. The USFS technical report (RM-189) *An Analysis of the Outdoor Recreation and Wilderness Situation in the United States: 1989–2040* does not address or mention search and rescue. This appears to be a low priority for the BSAR community, but it is an area to consider for future improvement.

Lastly, the study team researched other BSAR models that are currently used across the United States and the world. The western United States generally follows a similar model to Colorado, where sheriffs and BSAR volunteers largely carry out BSAR responses. In the eastern United States, fire departments and natural resource employees often fulfill their SAR needs. In Europe, there are many countries that charge the public for SAR services, and having rescue insurance is the public norm. This rescue insurance pays for training, equipment, and a system that supports the BSAR volunteers. The public either pays for well-advertised supplemental rescue insurance, or it's included in their national insurance. It's important to note that while these other systems have their advantages and disadvantages, differences in societal norms

⁹ <https://www.usfa.fema.gov/data/statistics/states/colorado.html>

and BSAR needs unique to Colorado would make a transition to a drastically different model a difficult and risky maneuver.

Recommendations:

The study team was asked to “improve and develop a sustainable structure for coordination” among BSAR partners. Merriam-Webster defines coordination¹⁰ as “the process of organizing people or groups so that they work together properly and well”. With some exceptions, we heard that the coordination works remarkably well for BSAR considering the complexity of BSAR relationships (see Figure 2). The decentralized model where county sheriffs and their BSAR teams can handle BSAR the way they see fit, with full consideration for unique local challenges, is of value to the BSAR community as a whole. As one BSAR volunteer stated: “Don’t change much right now as we have some of the best BSAR available in the world.”

Below are recommendations to improve elements of the current coordination structure. Many of the other comments above regarding coordination challenges will be addressed in subsequent chapters of this report.

- **Establish standing meetings to develop and deepen partnerships** - The most common suggestion across all of our interviews was a desire for more standing meetings with local and neighboring partners, especially as staff and volunteers turnover. When BSAR issues are understood and addressed by all partners, solutions are often more creative and effective. Some reasons to call a meeting with partners include: preparing teams and resources for the summer recreation season, sharing data and reflecting on winter incidents, multi-agency coordination training sessions, or simply to better understand and appreciate each other’s goals and challenges related to BSAR.
- **Improve field communications** - Provide sheriffs and BSAR teams funding to purchase, program, and maintain communications equipment to improve communication technologies and capabilities between sheriffs and BSAR teams. Have a paid staff person collect additional information on specific radio and satellite communication needs by December 1, 2022
- **Strategically increase the use of helicopters** - Helicopters are force multipliers and consideration should be given to strategically increasing the use of them to improve BSAR incident response efficiency and effectiveness. Hoist/longline-capable helicopters can significantly reduce the number of needed rescuers and the time required on a given incident. To provide modern BSAR services Colorado needs dedicated (as in first priority) BSAR helicopters to support BSAR teams and sheriffs across the state. Dedicated helicopters are expensive, but efficient. Their mission can be shared to include use in fire and law enforcement, but their primary responsibility is to BSAR. BSAR leaders should consider the value and cost to have a helicopter dedicated to BSAR needs, and have a conclusion by December 1, 2022.
- **Obtain helicopter-searching technologies** - Two specific technologies used from a helicopter can significantly increase the reach and speed of BSAR teams when searching for lost persons.
 - *LifeSeeker*: Many Colorado prairie, canyon, and mountain areas have no cell phone service, and *Lifeseeker* is an airborne phone location system that is basically a mobile cell tower.¹¹ From a helicopter (or an airplane), the

¹⁰ <https://www.merriam-webster.com/dictionary/coordination>

¹¹ <https://www.centum-rt.com/product/lifeseeker>

textbook-sized device acts as a temporary cellular service provider, connecting the subject's telephone to the team inside the helicopter. Text messages can be traded and GPS location coordinates can be obtained providing rescuers with the phone and subject's location. One or two Lifeseeker devices could be centrally located and shared with BSAR teams as needed – from a dedicated BSAR helicopter program. Currently, two Lifeseekers are in the US (WY and MT). The device costs about \$100,000.

- *RECCO SAR Helicopter Detectors* use the proven RECCO avalanche rescue technology in a larger, more powerful detector in the search of lost persons.¹² The system can search areas about the size of almost four football fields per minute. The device is used in AK, CA, MT, UT, WA, and WY. Currently, Colorado does not have a capable rescue service to use the system. The device can be leased or purchased (approximately \$50,000). Ideally, two systems could be centrally located and shared with BSAR teams as needed.
- **Standardize MOUs and other agreements** - CSAR, the state, and the sheriffs should work together to draft standard outlines for MOUs, mutual-aid assistance, and other agreements that partners can use to ensure they are addressing all key roles and responsibilities together. Having consistency in MOU structure will lead to clearer expectations between partners on incidents. Additionally, consistency will better enable opportunities to provide statewide protections, benefits, and other support systems for BSAR partners.



Photo credit: La Plata County Search and Rescue

¹² <https://recco.com/outdoor-rescue/>

BSAR TEAM PLANNING AND ADMINISTRATION

This section will address BSAR Team Planning and Administration, in the context of changing (and growing) BSAR needs.

Administrative workload concerns:

When BSAR leaders were asked what concerns them the most about the future of BSAR in Colorado, staying on top of administrative functions and its impacts on volunteer retention was raised across many teams. One respondent said: “Admin functions are absolutely essential to functioning SAR, but are horrendously boring and (personally) drains me from limited volunteer time and energy I would rather be spending on training and missions.” Another added: “For administrative tasks, I think some of those just need to be handled locally, and we do not have enough work to support paid admin staff, but it is borderline too much work for volunteers.”

What is meant by “administrative functions”?:

A BSAR team is an organization that must be run like a business to remain financially sound and capable of providing SAR services. Administrative activities include but are not limited to: volunteer recruitment, human resources (insurance, workers’ compensation, benefits), fundraising, accounting, inventory management, records management, fleet management and maintenance, mediation, external negotiation, public relations, marketing, and promotion. The conundrum facing BSAR teams and their volunteers is that, for the most part, individuals join teams to spend time helping others and being outdoors. However, it takes a tremendous amount of “behind the scenes” effort to successfully run a non-profit, and a style of work that’s particularly draining for volunteers.

Planning - another important piece of the puzzle:

The bill asked the study team to “improve and develop a sustainable structure” for BSAR. Sustainability, as defined by Merriam-Webster, is the ability to last or continue for a long time ([Merriam-Webster](#)). Having a decentralized structure where each county can utilize local resources (volunteers) in a variety of ways, is a strength of the current system. Smaller teams and counties can use the resources that they have, while relying on neighboring teams in greater times of need. However, this system can only sustain if paired with proper planning and a regular reassessment of resources, partnerships, and needs. As it stands now, most teams are operating without a larger strategic plan to guide their decision-making and plans for the future.

Considerations:

Planning and administration are both essential functions for non-profit BSAR teams. They go hand-in-hand, but one should strategically start before the other. As discussed in the section above, a regular reassessment of resources, partnerships, and needs is vital to the sustainability of the system. What this practically means is that BSAR teams should, every few years, evaluate their team’s effectiveness and efficiency with regards to their BSAR demands (calls/incidents).

As recreation use expands and changes, teams may or may not be able to realistically meet demand. They may find that continued small mission loads per year mean that moving from

being a standalone nonprofit organization, to a team under the county, may make sense to save administrative costs and time. The opposite could be true, where increasing calls may warrant the formation of a new non-profit team. Before teams try to address current challenges like administrative tasks, they should make sure that they have a right-sized structure for the current (and future) BSAR demands, realizing that there are well-established teams out there that can give assistance in times of need.

On the administrative side, there are many BSAR teams that are not well equipped to run their non-profit effectively. With a full workload on SAR incidents and current administrative tasks, teams are often playing “catch-up” and don’t have the time, and at times the expertise, to run all aspects of their non-profit as they’d like to. The study team heard that these team’s are having challenges across many administrative categories but reporting and budgeting were near the top. If some administrative tasks were centralized (supported by CSAR, the state, or others), volunteer teams should, in theory, have additional capacity to focus on other important tasks. There’s also an argument to be made that teams will be more likely to secure public and private funding if they are able to provide sound budgets that are guided by their team’s adopted strategic plan.

The exciting news is that if these teams had the proper skills, time, and capacity to stay ahead of important administrative tasks, the teams would be better protected legally and they could enable other system-wide improvements such as better data collection and understanding of statewide recreation trends (which can, in turn, allow for more effective BSAR planning and growth).

Recommendations:

- **BSAR teams should have a strategic plan** - BSAR teams used to operate successfully without a strategic plan, as BSAR demands didn’t change much year over year. Now, in a changing BSAR environment where there are more and new types of incidents, having an adaptable plan for the future will be essential to anticipate and more adequately respond to shifting BSAR challenges. For more than just the scope of this section (planning and administration), BSAR teams should have strategic plans that outline their team’s needs and goals going forward. This can help to justify large equipment purchases as a means to meet an upcoming goal (such as, increasing capacity to meet growing BSAR demands). As it stands now, many teams have not developed these foundational documents that focus more on the business side of their team. To achieve this, here are a couple of paths that could be pursued:
 - **CSAR leads the way** - Part of CSAR’s mission is “...to empower every search and rescue team...to accomplish their goals and duties better...” ([source](#)). CSAR could create a business plan framework that teams could fill in based on their local needs and goals. CSAR could also tour the state, host workshops with nonprofit experts, and meet face-to-face with teams to discuss and document their goals.
 - **Make some aspects required for funding** - Require some key aspects of a strategic plan to be eligible for future funding. This recommendation has the potential to disproportionately impact smaller teams if not executed properly. A separate program designed to support the development of a plan should be considered.
- **Provide centralized administrative support** - This recommendation was raised often in survey results. Leadership from BSAR partner (CSAR, CSOC, and relevant state

agencies) should convene to identify which agency or group is best to provide support in key areas, including but not limited to: human resources (insurance, workers' compensation, benefits), accounting, records management, external negotiation, marketing, and promotion. This should be done by no later than December 1, 2022.

How could this be accomplished?

Providing support would mostly likely have to come in the form of paid staff support, at either the statewide or regional levels. Ideas include:

- Providing a bookkeeper to manage team accounts and provide financial advice could also be a cost-effective solution.
- Standardized, but BSAR specialized, accounting best practices could be taught to teams.
- Organizations like the Colorado Nonprofit Development Center (CNDC) could offer hands-on support in financial management ([source](#)). A conversation with their staff would be a good next step to determine if BSAR teams would be eligible for this type of support.
- Outside of paid professional assistance, the creation and sharing of best-practice administrative toolkits (including free standardized management and data collection tools) could help with certain administrative tasks.

STATE SAR COORDINATORS

This section will address the State SAR Coordinators - a key component of Colorado's BSAR system that receives essentially zero support.

Situation:

There are roughly 30 State SAR Coordinators across the state. They often work in teams of two providing on-call support and coordination for BSAR incidents. For sheriffs, they provide incident specific advice and resources during BSAR incidents that are escalating in complexity or when a county is experiencing simultaneous incidents. At other times, the State SAR Coordinators collaborate with DSHEM through the State Emergency Operations Center or the Field Managers. As needed, the State SAR Coordinators can quickly activate neighboring BSAR teams, as well as order federal assets such as helicopters to assist rescuers on the ground. They work in a team of two for 28 days/year (7 days per quarter). The two-person teams typically have more than 50+ years of BSAR experience. During their weeks they are committed 24/7 and most do this in addition to being active on their local team.

In addition to the large responsibilities and authorities given to these volunteers, they are operating on behalf of the state in these roles. An MOUs between the state (DHSEM), and CSAR, delegates authority to CSAR to recommend volunteers for these roles.

Considerations:

State SAR Coordinators, currently being filled by CSAR volunteers, have an immense amount of delegated authority and responsibility and receive no financial support for their efforts. The coordinators are, however, given some additional protections and benefits when they operate as a coordinator, since they are fulfilling these duties on behalf of DHSEM.

The study team finds that there is value in CSAR volunteers filling these positions, as they are passionate BSAR experts that fill the roles well. BSAR is also a highly specialized service that requires highly specialized expertise. DHSEM coordinators have responsibility over other emergency incidents such as wildland fires, floods, and hazardous material incidents. It makes sense to have BSAR subject matter experts lead the State SAR Coordinator positions, especially as DHSEM staff deal with increases in their other areas (notably, wildland fires).

Another interesting finding is that it appears these volunteer positions have little to no vetting. By not having something as simple as a background check in place, the state is taking an unnecessary risk when delegating powerful authorities to these volunteers without basic vetting measures.

Recommendations:

- **Cell phone plan reimbursement** - At a minimum, the State SAR Coordinators should be eligible for cell phone plan reimbursement. Because they are “on-call”, paying for their cell phone plans is a reasonable way to at least partially reimburse these volunteers for expenses that they normally cover. It would take about \$21,600/year to cover all the coordinators. (~\$60/mon/phone x ~30 coordinators).
- **Establish a program coordinator** - Find a way to pay for someone either at CSAR or DHSEM to coordinate these volunteer positions. Duties for this person should include duties such as looking into other ways to reimburse and provide support for these State SAR Coordinators. The issue of volunteer vetting (ie - Implementing background checks) should be addressed by this person as well.



Photo credit: Montezuma County Search and Rescue

CHAPTER 2 - PROTECTIONS AND BENEFITS

“The cost of workman's compensation insurance and how well it actually covers members is my largest concern. Insurance has been the largest expense and some alternatives can be restrictive in how teams are able to assist other counties. Insurance expenses are tough for both small and large teams.”

-BSAR volunteer

This chapter will address governmental immunity, workers' compensation, retirement benefits, and additional benefits for volunteers and their BSAR teams. Below are the specific bill study chapters that will be covered:

(2) THE AVAILABILITY AND ADEQUACY OF WORKERS COMPENSATION OR OTHER BENEFITS FOR INDIVIDUALS WHO ARE INJURED IN THE COURSE OF PROVIDING BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

(3) THE AVAILABILITY AND ADEQUACY OF RETIREMENT BENEFITS FOR INDIVIDUALS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

(7) ISSUES RELATED TO GOVERNMENTAL IMMUNITY FOR VOLUNTEERS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES;

BSAR teams and their volunteers participate in a wide variety of essential activities, from fundraising, public education events, maintenance, and training, to in-county and out-of-county incidents. Identifying protections and securing insurance coverage for individuals, teams, and equipment across all of these individual instances is challenging and labor intensive, especially for small nonprofit BSAR teams. Equally, when sheriffs are confused or struggle to fully understand protections and benefits of BSAR volunteers, it can impact their use of local BSAR teams. Addressing these issues can help BSAR partners put more focus to, and sometimes funding, towards other BSAR challenges.

What do BSAR teams think about current protections and benefits?

When asked to rank the top 3 most essential recurring expenses that you expect for your BSAR team during the next 5 years, BSAR leaders ranked insurance (worker's comp, general liability, etc.) as the most important, with medium and large teams ranking it even higher than other recurring expenses.

GOVERNMENTAL IMMUNITY

Situation:

Note - for this section we will refer to BSAR teams as “affiliated organizations” to align with the discussed statutes pertaining to immunity.

The Colorado Governmental Immunity Act (CGIA) *C.R.S. §24-10-101 – 120*, provides significant legal protections for public employees and government volunteers who have allegedly committed a tort within the scope of their employment. Torts are legal wrongs resulting in harm to persons or property. An individual’s legal duty to avoid causing such harm is implied by law without regard to any contract. The CGIA requires the State to pay the attorneys’ fees and costs associated with the defense of such a lawsuit and requires the State to pay judgments or settlements associated with such a lawsuit.

Civil liability protection, sometimes referred to as Good Samaritan laws, provide limited liability protection to persons who give aid on a voluntary basis in an emergency. These statutes are discussed below.

- Colorado's primary volunteer protection law: *C.R.S. §13-21-108* has limited capacity to protect individuals against civil liability,
- The federal *Volunteer Protection Action of 1997* provides very limited protection. For example, the VPA does not protect volunteers operating motor vehicles, nor does the VPA apply to the organization using the volunteers.
- Colorado’s Good Samaritan law *C.R.S. §13-21-108: Persons rendering emergency assistance exempt from civil liability*, does include an individual member of a volunteer rescue unit (presumably including BSAR affiliated organizations) offering “emergency care.” BSAR volunteers are covered by *C.R.S. §13-21-108(2)* as members of a “rescue unit”
 - Such laws were passed to encourage and protect bystanders – who might also be trained medical professionals – to provide first aid until an organized emergency medical service arrives on scene.
- Colorado’s *Immunity of volunteer firefighters, volunteers, incident management teams, and their employers or organizations – definitions – legislative declaration C.R.S. §13-21-113.7* protects BSAR individuals and their affiliated entities performing rescue and recovery. However, the declaration makes no mention of “search,” nor does it mention any BSAR affiliated organizations. The declaration mentions “incident management team” (IMT); however, IMTs tend to be designated teams of fire, EMS, and possibly law enforcement. SAR and BSAR are not often included in designated IMTs.
- Colorado’s *Volunteer service act – immunity – exception for operation of motor vehicles C.R.S. §13-21-115.5* protects a broad range of licensed healthcare providers from physicians to counselors who volunteer their time and expertise. The law does not address BSAR volunteers.
- Colorado’s *Immunity from civil liability for directors, officers, or trustees - nonprofit corporations or nonprofit organizations C.R.S. §13-21-115.7* protects volunteers serving in the governance of a nonprofit entity from civil liability provided their actions or omissions were within the scope of their official duties and not a willful or wanton act or omission.

- Colorado’s “bingo-raffle volunteers” are “immune from civil actions and liabilities” as expressed in *Volunteer services – legislative declaration – immunity C.R.S. §24-21-625.2*

Considerations:

While there is little to no precedent for BSAR litigation, it only takes one lawsuit for volunteers to walk away from their positions. In a BSAR operation gone wrong, a victim or their family has the opportunity to sue nearly anyone involved in the search, including volunteers. Nationally such actions are extremely rare, and there are no known cases of a Colorado BSAR affiliated organization (team) being sued for SAR work, including medical misconduct that went to trial. One BSAR affiliated organization was sued as it hosted an avalanche education program, but the team was later dropped from the lawsuit.

While history shows no legal action here in Colorado, the threat is real and if a volunteer(s) or team is found liable, volunteers and teams may quit because of insufficient or uncertain liability insurance, or lack of immunity. This happened in British Columbia, Canada in 2009, when a team was sued for negligence. While individual members appeared to have protection from “good samaritan” type laws, the teams were unprotected. Canadian news media reported, “As a result, several B.C. teams suspended or limited operations, and society executive members and directors stepped down from their positions, fearing they could lose their homes and personal finances if a major incident occurred”.¹³ As a result the provincial governments of BC and Alberta started paying for team liability insurance. It’s important to note that the volunteer BSAR structure in British Columbia is similar to ours here in Colorado.

Related to other sections within this chapter, another concern for BSAR is that volunteers are not always under the direction of the sheriff, potentially opening up gaps in certain protections and coverages. Depending on the facts of a particular situation, BSAR volunteers may be protected by the CGIA as volunteers. See *C.R.S. §24-10-103(4)(a)* (“Public employee” means an officer, employee, servant, or **authorized volunteer** of the public entity, whether or not compensated, elected, or appointed, but does not include an independent contractor or any person who is sentenced to participate in any type of useful public service. For the purposes of this subsection (4), “authorized volunteer” means a person who performs an act for the benefit of a public entity at the request of and subject to the control of such public entity and includes a qualified volunteer as defined in section 24-33.5-802(9). However, the CGIA does not apply to BSAR corporations. See *Safari 300, Ltd. v. Hamilton Family Enters., Inc.*, 181 P.3d 278 (Colo.App.2007) (a corporation cannot be a public employee under the CGIA).

The study team found a relevant academic paper that establishes a connection between immunity and volunteer retention. Horwitz and Mead (2009)¹⁴ found evidence of a positive statistical association between volunteering and immunity, but added that very little is known about how immunity affects the demand for volunteers. Another consideration is that if volunteers are only provided immunity, risk may shift to their affiliated organization (team). Horwitz and Mead explain that: “Volunteer immunity may make it more expensive for organizations in two ways: it shifts liability onto the organization, and it increases liability by removing individual incentive effects of tort exposure for individual volunteers.” Further, conventional wisdom holds “[T]he lower the wealth-at-risk of an enterprise, the greater the

¹³<https://www.canadianunderwriter.ca/insurance/b-c-government-to-insure-search-and-rescue-teams-1000367496>

¹⁴ <https://repository.law.umich.edu/articles/1387/>

likelihood that a [individual] volunteer will be sued personally...” and as Horwitz and Mead point out, the inverse is also true, as a plaintiff can make claims against the nonprofit if the volunteer has immunity.

Lastly, the study team deduces that good intentions and concern for personal safety may be preventing BSAR lawsuits. One of tort law’s purposes is to prevent risky behaviors. BSAR volunteers’ behavior in dangerous settings is based on personal safety—to protect their life and the life of those they are called to help. This may be impacting the low number of lawsuits seen in the BSAR community, both within Colorado and across the nation.

Recommendations:

- Expand and explicitly state that BSAR volunteers and their affiliated organizations (teams) are included in the protections of *C.R.S. §13-21-113.7*
- Add members of “rescue units” as defined in *C.R.S. §25-3.5-103(11)* to the list of volunteers in 13-21-115.5
- Remove “grossly negligent” from associated statutes, such as *C.R.S. §13-21-113.7*. Whether someone acted in a grossly negligent fashion is likely a question for the jury and, as a result, litigation will go on and on. Immunity is most effective when a defendant can win a motion to dismiss. For example, the CGIA only allows tort claims to proceed against government employees / volunteers if their conduct is willful and wanton (see below) or outside the scope of their employment (like an assault off duty).
 - The CGIA provides that public employees are generally immune from any tort claim that “arises out of an act or omission of such employee occurring during the performance of his duties and within the scope of his employment unless the act or omission causing such injury was willful and wanton.” *C.R.S. §24-10-118(2)(a)*, An act or omission that is willful and wanton is conduct that is “not merely negligent; instead, it must exhibit a conscious disregard for the danger.” *Martinez v. Estate of Bleck*, 2016 CO 58, ¶ 32. See also, *Moody v. Ungerer*, 885 P.2d 200, 205 (Colo. 1994) (willful and wanton conduct “means conduct purposefully committed which the actor must have realized as dangerous, done heedlessly and recklessly, without regard to consequences, or of the rights and safety of others....”).

WORKERS’ COMPENSATION

Situation:

Workers’ compensation insurance provides medical expenses, lost wages, and rehabilitation costs to employees who are injured or become ill in the course and scope of their work. By Colorado statute nearly all businesses with employees working in Colorado are required to have workers’ compensation insurance, regardless of the number of employees, and whether they work part-time, full-time, or are family members. By statute, volunteer members of search and rescue teams are deemed as employees while performing duties as...members of such volunteer rescue teams or groups...and while engaged in organized drills, practice, or training necessary or proper for the performance of such duties *C.R.S. §8-40-202(1)(b)*.

In general, while BSAR volunteers are performing duties under the direction of the county sheriff, workers' compensation coverage may be available depending on the type of activity and the agreement with the County. The Colorado *Workers' Compensation Act C.R.S. §8-40-202(1)(a)(I)(A)*, defines an *employee* as any member of a variety of volunteer organizations including “*volunteer rescue teams or groups*” and “*volunteer search teams or groups*” who is performing SAR duties under the direction of the county sheriff, and those duties also include organized training sessions. However, the act does not address other duties critical to the operations of a nonprofit BSAR team such as maintenance or fundraising activities. Additionally, many volunteer leaders provided written comments suggesting that workers' compensation be a focus area of improvement. One BSAR leader went as far to say that their sheriff's office “has gotten very hesitant in allowing our response because of how they view their responsibility of our risk” pertaining to workers' compensation.

In Colorado there are two main sources of workers' compensation insurance available for BSAR volunteers:

CTSI (via County Workers' Compensation Pool)

This type of coverage operates through the county. As of 2021, about 45 BSAR teams relied on their county's coverage through CTSI. (2021 CSAR Membership Data) CTSI coverage requires volunteers to be “under the supervision and control of the sheriff...” (CTSI, 2018. CWCP & CAPP Operations Manual, 07/11 4 CWCP Coverage 2). CTSI only covers volunteers “engaged in organized drills, practice or training necessary or proper for the performance of such duties under the control, direction and supervision of the member county sheriff.” (CTSI, 2018. CWCP & CAPP Operations Manual, 07/11, 4 CWCP Coverage 2)

Considerations

- Coverage costs for BSAR teams under this model are unknown as they are part of the county workers' compensation plan. These teams pay nothing for this coverage.
- CTSI coverage is generally limited, and may not cover many SAR-related activities, including fundraising, PSAR, conferences, etc.
- CTSI has requirements on the operations and governance of a covered non-profit organization that many likely don't know about. The member county “must have” at least one of the following controls over the entity:
 - “approves 50% or more of the governing body of the entity; **or**
 - approves the budget of the entity; **or**
 - provides 50% or more of the funding of the entity; **or**
 - hires, fires or directs the activities of those performing the contractual activities of the entity (may be through appointment of the governing body).” (CTSI, 2018. CWCP & CAPP Operations Manual, 08/13, 6 CWCP & CAPP Coverage 3)
- CTSI requires non-county SAR teams to have a CTSI-approved MOU already provided to CTSI that a SAR non-county, nonprofit SAR team can provide services to the outside county. (CTSI, 2018. CWCP & CAPP Operations Manual, 08/13, 6 CWCP & CAPP Coverage 4)
 - Members of a statewide team (e.g., Colorado Hoist Rescue Team) would require their local sheriff to have an MOU with all other counties.

- The CTSI MOU template only mentions lost or injured persons with no mention of recovery of deceased persons.
- It should be mentioned that while 51 teams rely on their county for workers' compensation coverage through CTSI, only about 34 teams have MOUs with their sheriffs (personal communication, Woody Woodward, CSAR, 2021)

Pinnacol Assurance

Pinnacol Assurance is a quasi-public authority that's often the "insurer of last resort" for organizations that have trouble securing insurance elsewhere. About six teams purchase insurance provided by Pinnacol, which offers more robust and comprehensive workers' compensation insurance (e.g. coverage while performing SAR out-of-county and out-of-state, performing fundraising, participation in conferences, SAR-related meetings, etc.) A couple of counties in Colorado pay for their SAR team's Pinnacol Assurance outside of the sheriff's budget.

Considerations

- Policies are expensive ranging from approximately \$20,000 to \$40,000 per year, and are based partially on the size of the SAR team in addition to assessed risk.

Self-Insured Counties can also provide workers' compensation. Obligations are paid directly from the earnings and assets of the county. However, it's unknown if any BSAR teams rely on this approach.

Considerations:

Workers' compensation for BSAR volunteers is most often provided by the sheriff (the county). However, in order for CTSI to cover BSAR volunteers, they must be "under the supervision and control of the sheriff." There is uncertainty from both sides on whether the sheriff or one of the sheriff's supervisors needs to be physically present or if they can supervise via a radio or cell phone. Additionally, adhering to this CTSI requirement for workers' compensation limits the ability for the SAR team and the sheriff's office to adapt to fast changing circumstances. There is general agreement that other core duties of SAR teams (fundraising, maintenance, meetings, travel to/from activities, etc.) do not fall under the supervision and control of the sheriff. There are additional detailed requirements that BSAR teams and counties are unaware of, including member county control requirements.

Current workers' compensation coverage for BSAR volunteers: is not comprehensive, varies by the provider, and has varying coverage when assisting other counties and states. Generally, volunteers are covered under the entity (county) that they're working for and not the county that they end up doing work in. This can cause confusion for the BSAR volunteers, being unsure if they are covered when they cross county or state lines. During incidents, State SAR Coordinators must always ask questions pertaining to workers' compensation. At times they can send BSAR teams with Pinnacol Assurance workers' compensation to other areas of the state more easily than they can send much closer teams with other workers' compensation coverages. This delays response and creates an uncertain resource utilization situation.

Generally, workers' compensation is a large cost for a team to purchase by themselves, and it can be even more expensive if the team uses minors. For Pinnacol Assurance, fluctuations in insurance cost is an additional challenge that team's must consider.

Due to all of the variables and uncertainties noted above, it is unrealistic to expect all-volunteer BSAR teams with limited administrative resources and training to be able to understand precisely where coverage exists and how to secure additional protections for their teams' activities. Some counties are giving money to BSAR teams for workers' compensation partly because of this confusion, but also to enable the teams to respond out of their normal response area.

Lastly, near the end of the study period, potential for workers compensation coverage through the Colorado Department of Public Safety was identified in C.R.S. Title 24 (Government - State), Article 33.5 (Public Safety), Part 7 (Emergency Management), and Part 8 (Compensation Benefits to Volunteer Civil Defense Workers). This information was shared with relevant BSAR partners for further investigation.

Recommendations:

- **Pursue a single coverage option:** CSAR, CSOC, and the state should approach Pinnacol Assurance and CTSI to discuss what a single coverage option could look like for BSAR teams and have a conclusion by December 1, 2022. This would not only provide important coverage that's clearer to understand, it would allow BSAR team administrators the ability to focus on other important duties. By pooling together a large number of volunteers (employees), preferred rates and BSAR specific classifications may make this a cost effective option.
 - CSAR has had previous positive conversations with Pinnacol Assurance about this idea as recently as 2019 that stalled due to the pandemic, funding, and other factors.
- **Investigate additional coverage potential through the Volunteer Civil Defense Workers Act:** BSAR partners should work with DPS to better understand the potential for additional BSAR volunteer coverages under the Volunteer Civil Defense Workers Act (C.R.S §24-33.5, Part 8).
- **Better understand current coverage:** If a single coverage option isn't feasible, BSAR Leaders should approach Pinnacol Assurance and CTSI to understand current coverage areas and gaps. Outline the breadth of activities that nonprofit SAR teams engage in¹⁵, including complexities related to out-of-county/state responses and multi-agency responses with shifting commanding authorities. Report findings back to BSAR teams.
 - Teams, sheriffs, and counties should use the information above about general CTSI/Pinnacol coverage to discuss their team's insurance policy with their underwriter and document areas of coverage and gaps.

¹⁵ Such as fundraising, public events, equipment maintenance, facility maintenance, vehicle maintenance, field trainings, internal meetings, external meetings, and search/rescue/recovery missions both within- and out-of-county

RETIREMENT BENEFITS

Situation:

Currently there are no retirement benefits available to Colorado's volunteer BSAR volunteers outside of what an individual may have through their work or personal savings.

Providing retirement benefits to volunteers is not a new idea. Since the 1960s pensions have been used for decades as an incentive to retain Colorado's volunteer firefighters. In Colorado, prior to 1978 any such plans were administered and funded by local governments. A 1977 study for the legislature found that all plans in total were underfunded by more than \$500 million. In 1978 and 1979 the legislature adopted legislation reforming the pension system, which included a state contribution. In 2004, management of the fund was transferred from the Firefighter & Police Pension Association to the Department of Local Affairs (DOLA). In the 10 years from 2010 to 2019 the state has contributed annually an average of \$4.22M, shared across an average of 221 different funds.¹⁶

The Volunteer Firefighter Pension Act *C.R.S. §31-30-11* provides three forms of retirement benefits and requires volunteer fire departments to offer disability and funeral benefits, and also allows for departments to offer survivor benefits. In 2016, 235 plans were in effect with 70% paying a monthly benefit between \$100 to \$650. *C.R.S. §31-30-1110* allows for a fire protection district to levy a tax not to exceed one mill on taxable property (any new tax or an increase in the mill levy requires approval by the voters). Programs that choose may participate in a state assistance program, to which the State contributes about \$4.2 million each year, and those contributions go to about 89% of plans.¹⁷ Through DOLA, the state also contracts to provide Accidental Death and Disability Insurance for Colorado volunteer firefighters. All volunteer firefighters are covered for any on-duty activities, including travel to and from any event.¹⁸

Other states offer pension-like programs known as Length of Service Award Programs (LOSAP) to recruit, retain, and reward volunteer firefighters and Emergency Medical Services (EMS) personnel. Funding for LOSAPs comes from local governments. Currently, it is not known how many LOSAPs are in use in Colorado. The Pension Act does not provide state funding for LOSAPs.

There is at least one example of a state including BSAR volunteers in a retirement program. In 2019, Wyoming amended their Volunteer Firefighter and EMT Pension Account (1967) to include volunteer search and rescue members. To fund the account, the Wyoming legislature directed an increase in the percentage of fire insurance premium taxes transferred from the general fund to the account. Also, volunteer SAR members contribute \$30 each month, which is twice the amount paid by volunteer firefighters and Emergency Medical Technicians (EMTs).

¹⁶ <https://cdola.colorado.gov/funding-programs/volunteer-firefighter-pension-fund>

¹⁷ <https://www.fppaco.org/PDF/ER/OH-Vol/VFPP%20Report%209-16.pdf>

¹⁸ <https://cdola.colorado.gov/funding-programs/volunteer-firefighter-pension-fund>

Considerations:

The volunteer survey showed that having access to retirement benefits for BSAR volunteers is not a concern at this time. When asked to rank the importance of seven benefits for their continued participation in BSAR activities, retirement benefits for their BSAR work ranked the lowest, with 39% of responders rating retirement benefits as “not important.” Less than 2% responders mentioned pension benefits as a “top idea or solution” to improve BSAR. Additionally, 83% of respondents stated that they have their own retirement account outside of their BSAR activities.

Adding volunteer BSAR members to the existing Volunteer Firefighter Pension plan would take additional sustainable funding sources, and may also strain relationships between BSAR volunteers and firefighting volunteers as they pull from the same retirement fund, especially as pension fund longevity remains uncertain.

Setting up a new pension program for BSAR volunteers would take a substantial amount of effort, which would include additional taxes, donations, volunteer contributions, legislation, etc. Unlike the fire fighting model where there is often a strong connection and short distance between the volunteer firefighters and the ones receiving services, recreators often travel hours from home where they may need rescue services. This difference may make fundraising locally for BSAR volunteer pension programs even more challenging than the firefighting pension program.

Pension funds are often implemented to recruit and retain volunteers, but the practice doesn't have proven success. Despite the widespread implementation of pensions, volunteer firefighter numbers have continued to decline since 1983 when the National Fire Protection Association began tracking firefighter numbers.¹⁹

Recommendation:

- **No action at this time** - Creating a retirement benefit program for volunteers should be a low priority at this time. The amount of funding needed for a successful and sustainable pension program could be better utilized to support other BSAR benefits and needs.

¹⁹<https://www.nvfc.org/new-nfpa-report-finds-significant-decline-in-volunteer-firefighter-numbers/>



Photo credit: Rampart Search and Rescue

OTHER BENEFITS

Accidental Death and Disability

Since 2004, Colorado has provided Accidental Death and Disability (AD&D) Insurance for Colorado volunteer firefighters (C.R.S. §31-30-1134) killed in the line of duty. While Colorado does not offer AD&D benefits to BSAR volunteers, the US Department of Justice Public Safety Officers' Benefit Program (PSOB) offers death and higher-education benefits to survivors of fallen first responders, which includes a "member of a rescue squad" (42 U.S.C. § 3796b Sec. 1204 Definitions). At the time of this report, the current benefits are \$389,825 for death and disabilities.²⁰

Thankfully, line of duty deaths for BSAR members are very rare. Only one BSAR volunteer member has died in the line of duty since 1970 (training – 1986).

Survivor Education Benefits

As previously mentioned, the Federal PSOB Program provides higher-education benefits to survivors or BSAR volunteers. Currently, the benefit for education assistance is \$1,298 per month.²⁰

Nevada has a program that covers higher education costs for dependent children of public safety officers killed in the line of duty. This program covers members of a search and rescue organization that are under the direct supervision of any county sheriff. Through this program the Board of Regents shall pay all registration fees, laboratory fees and expenses for required

²⁰ <https://bja.ojp.gov/program/psob/psob-data>

textbooks and course materials for classes taken towards satisfying the requirements of an undergraduate degree at a school within the System. (Nevada Revised Statutes 396.545)

Pinnacol Assurance has a foundation that provides scholarships to the children of people seriously injured or killed on the job. It is uncertain as to whether BSAR volunteers' service qualifies for this benefit, when they are sometimes considered "employees" while under direction of the sheriff. Since the foundation's launch in 2000, Pinnacol has awarded \$6 million in scholarships to nearly 650 students across Colorado. Scholarships average \$4,700 per student per year and are made without consideration of which insurance company covered the parent's claim.

Leave and Job Protection

In 2008, a bill passed that allows BSAR volunteers the ability to take up to 15 working days each year to respond and/or train for disaster emergencies. Approximately seven BSAR teams have applied to be eligible for this additional protection for their members. However, very few have been able to use this protection since declared disasters are very rare. Additionally, eligible volunteers may not want to leverage this protection as it strains relationships with unsupportive supervisors, causing other issues with their employer and work duties.²¹

Considerations:

Providing these additional protections and benefits for BSAR volunteers provides value to CSAR, sheriffs, and the state by bolstering recruiting and retention incentives for current and prospective volunteers. Also, the study team has a slight concern that some teams are purchasing AD&D insurance thinking that they are filling in coverage gaps from workers' compensation. This should be clarified to teams.

Recommendations

- **Compile, in one place, all relevant benefit and insurance information related to BSAR** - Pay a person at CSAR to compile this information and disseminate it to BSAR teams by December 1, 2022. Depending on the outcome of additional coverage pursuits mentioned above, this compilation should include:
 - Accident and Sickness Insurance to overlap Worker Comp Insurance
 - General Liability Insurance
 - Property Insurance
 - Vehicle Insurance
 - Management (Directors and Officers) Insurance
 - Public Safety Officers' Benefit Program (PSOB) related to death, disability, and survivor education benefits.
- **Survivor Education Benefit** - Providing an in-state education benefit for survivors of fallen BSAR volunteers would show the state cares about the essential services that these volunteers provide. This is already done here in Colorado for dependents of deceased or permanently disabled law enforcement officers, National Guardsmen, and firefighters (C.R.S. §23-3.3-205). The state should consider adding BSAR volunteers to this list for these additional protections.

²¹<https://dhsem.colorado.gov/emergency-management/logistics/resource-mobilization/volunteer-workers>

CHAPTER 3 - TEAM FUNDING AND SUPPORT

“If the state [tourism office] keeps up the outdoor rec focus in its marketing, they need to provide adequate education campaigns/funding to match the amount of outdoor rec they promote.”

-BSAR volunteer

Funding and support for BSAR goes to two main areas: BSAR teams and BSAR individual volunteers. This chapter will cover funding and support for the BSAR teams. Funding and support for individuals will be covered in the INDIVIDUAL AND TEAM EXPENSES chapter below.

This chapter will cover the team funding aspects of the following bill study chapter:

(5) THE AVAILABILITY OF NECESSARY EQUIPMENT AND THE NEED FOR FUNDING TO OBTAIN, MAINTAIN, AND REPLACE EQUIPMENT AND OPERATE BACKCOUNTRY SEARCH AND RESCUE TEAMS;

Situation:

Yearly expenses for a small team may run less than \$10K; large, busy teams have yearly recurring expenses of over \$200K.

BSAR teams that are closely affiliated with their local sheriff's department may receive a majority of their funds from the sheriff's department. Many teams rely on public grants and donations to meet operating costs, and the state's SAR Fund for equipment and training reimbursements. Donations/contributions for such teams typically account for 70 to 90+% of their revenues. Some teams require, or at least expect volunteers to participate in various bake-sale-type events or pay dues to keep their teams operating.

Other than a small amount of Payment In Lieu of Taxes money from the USFS, federal funds for BSAR are practically zero; however, indirect support occasionally occurs in the form of collaboration in matters of public information. Nonfinancial support largely comes in the form of volunteering, which is central to the current BSAR model. Individual members contribute mightily to their organizations in terms of time and money.

Current Team Funding:

Below is an overview of the main funding sources for BSAR teams:

LOCAL

Sheriff Offices - Depending upon the affiliation of the BSAR team with their local sheriff (e.g., department program, posse, independent non-profit) the team may or may not receive funding from the sheriff's office or county. Sheriff office funding can be used to support teams in many areas, including but not limited to equipment, training, and workers' compensation coverage. Of the 41 responding sheriffs, 24 have a line item in their budget that goes to their local non-profit SAR team; 19 gave specific figures ranging from \$500 to \$264,000. (The average was \$33,000.) In some counties, funds are provided through the county's general fund. For some teams,



Photo credit: Alpine Rescue Team

STATE

Search and Rescue (SAR) Fund - In 1987, the SAR Fund was created per C.R.S. 33-1-112.5 to reimburse agencies for costs incurred in search and rescue activities. It was created in response to the need for financial assistance with search and rescue in remote locations. Currently the program is administered by the Department of Local Affairs (DOLA) with one full-time paid staff member.

The program supports SAR activity primarily connected to backcountry, outdoor activity or recreational pursuits; it is not intended to be for urban SAR. There have historically been two streams that contribute to the fund:

1. Purchasing of fishing and hunting licenses, and off-highway vehicle, boat, and snowmobile registrations automatically contributes to the SAR Fund (currently set at \$0.25). These fees are collected by CPW and passed over to DOLA.
2. Purchases of a Colorado Outdoor Recreation Search and Rescue (CORSAR) card also contribute to the SAR Fund. The CORSAR card is available for \$3 for one year or \$12 for five years.

The fund works by allowing BSAR teams and their counties to request reimbursements (through their counties) for incidents where the subject being rescued had a CORSAR card/stamp from either of the two categories above. These funds are available throughout the year for incident reimbursements (which typically goes back to individual volunteers). At the end of the year, any remaining funds are divided and disseminated to counties across the state for the purchase of training and equipment (typically, team-level support items). Most of the SAR Fund is used for those end-of-year purchases.

On average, the program gives approximately \$500K per year to Counties. Table 4 (below) shows a breakdown of where these funds come from (left column) and the average breakdown of activity types that require BSAR services (right column). Please note that the right column is not limited to reimbursable incidents, but rather it is the breakdown of activities across all BSAR incidents in a given year, regardless of whether or not the subject had a CORSAR card.

Table 4 - SAR Fund Revenue and Incident Activity Comparison

SAR Fund Revenue Sources State Fiscal Year 20-21			BSAR Incidents by Activity Calendar Year 2020	
Funding Source	Revenue Totals*	Revenue %	Rec Activities Prompting SAR	% of Total Incidents
Fishing Licenses	\$325,561	49%	Hiker/Climber	55%
Hunting Licenses	\$150,914	23%	Biker/Skier	14%
CORSAR Card Sales	\$105,027	16%	Hunter/Fisherman	6%
Off-Highway Vehicles, Boats, Snowmobiles	\$85,842	13%	Snowmobile	4%
			Off-Highway Vehicles/Boating	9%
			Other (Aircraft, horseback, caving, kite-boarding)	12%

*These totals do not account for SAR Fund staff and administrative costs

A very apparent takeaway is that the fishing and hunting communities are paying for most (71%) of the state's SAR funding while they only account for 6% of BSAR incidents. Off-highway vehicles users, boaters, and snowmobilers pay-in about equally as much as they use BSAR services (13%). The voluntary CORSAR card is designed to account for the rest of the activities that do not have a mandatory SAR fee (hiking, climbing, biking, horseback riding, etc). The card generates 16% of the SAR Fund revenue but those user categories account for 81% of the BSAR incidents.

There are some small caveats to this comparative analysis. It's worth mentioning that Coloradans and visitors participate in many activity types in a given year. A person could be deemed a "hiker" for a BSAR incident if they were injured while scouting for a hunting trip later in the year. We think that these instances don't account for big shifts in the data, and therefore the large funding discrepancies per activity types are sizable and real.

While the SAR Fund has been supporting BSAR teams for decades, many are still confused as to how the CORSAR card/fee benefits the purchaser. Many feel that it's some type of insurance, when in reality, it enables the rescuing team to be eligible for SAR fund reimbursement. Even through this confusion, CORSAR fees and card sales continue to grow and support BSAR teams.

HB 21-1326 General Fund Transfer

The passing of House Bill 21-1326 moved an additional \$2.25 million from the state's general fund into the SAR fund to support backcountry search and rescue efforts, including incident response costs, equipment, services, and other related SAR expenses. This one-time influx of funds is an exciting opportunity to support BSAR teams in ways Colorado has not supported teams in the past. The new BSAR Flexible Fund Grant Program provides an expansive

opportunity for BSAR teams to identify organizational priorities and access funding for higher cost areas of need.

The BSAR Flexible fund is divided into four funding opportunities over three years using bi-annual competitive grant processes or “phases”. The first phase applications opened in October of 2021. Awards were granted on January 6, 2022. A majority of applications requested four-wheel drive vehicles such as trucks and vans

BSAR Flexible Fund Phase 1 – Total Grant Funds Available \$600,000

31 Applicants (15 County; 16 Nonprofit)

Applicant Total Project Costs: \$2,625,855

Applicant Total Grant Requests: \$2,281,855

10 Awards

5 county awards totaling \$271,435 (grant funds \$249,735; Match \$21,700)

5 nonprofit totaling \$402,970 (grants funds \$350,264/match \$52,702)

SB 21-249 Keep Colorado Wild Annual Pass

This act creates a new state parks pass (the Keep Colorado Wild (KCW) Pass²²) that will provide additional funding for BSAR. After the first \$32.5 million in revenue is allocated to state park operation and maintenance each year, BSAR will receive up to \$2.5 million per year to address BSAR needs across the state. The new pass will be available to the public starting on January 1 2023. However, with only six months of collections in Fiscal Year 2022-2023, it is unlikely that additional funding will spill into the SAR Fund until the end of Fiscal year 2023-2024. As a result, new funds for BSAR resulting from the KCW Pass will likely be available in July 2024 at the earliest. We will address this upcoming funding in further detail in the Considerations and Recommendations sections below.

FEDERAL

While a majority of Colorado BSAR incidents occur on federal lands (USFS and BLM), Colorado BSAR teams receive minimal, if any, federal funds. Federal money is almost always a result of a BSAR team deploying to a federally declared disaster – a rare occurrence for Colorado BSAR teams. If a team is deployed, it may receive compensation for assets (typically vehicles) used. Individual BSAR members deployed to a federally declared disaster may receive direct compensation and reimbursement as they may be deemed federal employees covered under the Federal Employees Compensation Act, but such actions are very rare.

PRIVATE

Solicited donations and fundraisers are core funding mechanisms for many teams. For example, one large Front Range team receives 70 to 80% of their yearly revenue through donations. While soliciting donations and hosting fundraisers works well for some, it takes time and skill to keep these funding streams active and healthy. Having active social media accounts managed by a public information officer on a BSAR team can help to garner local support and awareness of BSAR’s essential services.

Another private source of funding is grant opportunities. The study team didn’t hear teams mention these as a main source of funding. There could be improvement in this area as BSAR

²² <https://cpw.state.co.us/aboutus/Pages/Keep-Colorado-Wild-Pass.aspx>

continues to build its image as an essential service to local communities, and the state as a whole.

INDIVIDUAL MEMBERS

A few teams require membership dues. Though the dues are relatively small, they provide a hardship for some members. Also, when a BSAR team needs a piece of equipment, or a bill paid, it is not uncommon for individual members to cover the expense without reimbursement.



Photo credit: Alpine Rescue Team

Current Team Support:

BSAR teams receive many types of non-financial support:

Volunteers - Volunteers are the backbone of the entire BSAR system. Based on the best available data, the value of direct expenses and donated time by volunteers is estimated at \$21 million annually. This figure is explained in more detail in the **INDIVIDUAL AND TEAM EXPENSES** chapter below.

Sheriff Offices - Many sheriff offices provide in-kind support for services and supplies (e.g., vehicle maintenance, radios and programming, meeting and garage space, rescue equipment, etc.)

Friends, family, and employers - It should be acknowledged that family, friends, and employers support for volunteers is essential, and often goes unnoticed. BSAR volunteers need to be ready to act at any moment, and it's these other groups that enable volunteers to respond to an incident and to be on one for as long as it takes.

CSAR - CSAR provides numerous aspects of support for BSAR teams. This includes education to SAR teams through specific classes and hosting the annual Colorado Search and Rescue Conference (SARCON) and providing scholarships to attend. CSAR notifies its membership of grant and discount opportunities. CSAR supports BSAR teams by extending radio licenses to all teams; providing advice on internal governance, relationships, best practices, fundraising, and assisting with interagency issues. CSAR also provides the State SAR Coordinators and provides support for Public Information Officers (PIOs). As of the last few years, CSAR has taken on an advocacy role and represents all of the BSAR Teams to local, state, and federal authorities.

Outdoor Recreation Industry - Outdoor recreation is an economic powerhouse across the United States and especially here in Colorado. Despite the challenges of COVID-19, the outdoor recreation economy in Colorado added \$9.6 billion in outdoor recreation value (GDP) and employed 120,063 people, according to the Bureau of Economic Analysis (BEA) and the Outdoor Industry Association (OIA).²³ Colorado is number one in the country for snow activities (skiing, snowboarding, snowmobiling, snowshoeing, etc.), adding \$1.2 billion in value (GDP) to Colorado's economy in just this category alone.

Many companies currently give discounts for new and replacement gear for BSAR members. Some companies have philanthropic programs, but the study team was not able to identify any that directly support BSAR teams. There have been efforts to have outdoor companies contribute financially to BSAR via taxes or fees, but those conversations have fizzled out due to a lack of widespread support, especially at the trade association level. CSAR has been working with the Outdoor Recreation Industry on these ideas and opportunities through the years, but real progress has yet to be made.

Responder Alliance - The Responder Alliance is an advocacy and training focused organization, with a focus on the austere responder. Responder Alliance supports research, training and grass roots resiliency efforts for outdoor professionals, ski patrol, avalanche and snow workers, and austere emergency responders.²⁴ Responder Alliance is based in rural Colorado, and is leading the statewide pilot for stress injury awareness, traumatic stress mitigation, incident support tools, and psychological first response for rescuers. Responder Alliance utilizes field-based task forces, resilience teams and embedded cultural tools to impact the national conversation on stress injury formation and mitigation, and responder and organizational vitality. They partner with BSAR teams in Colorado to spread awareness and resources about the important topic of psychological stress.

Considerations:

To adequately fund and support both teams and individual volunteers, the BSAR community needs to pull from a wide variety of sources. The BSAR Summit held on 10/25/21 took this thought one step further: "Secure adequate funding from all beneficiaries, including user groups and the outdoor rec industry". As can be seen in Table 4 (on page 43), the recreation classes currently supporting BSAR financially through the CORSAR card/fee are not the same ones that are largely being rescued. This disparity should be addressed through additional pursuits to better balance funding across the users needing BSAR services. Besides being more "fair", it's

²³ <https://outdoorindustry.org/advocacy>

²⁴ <https://www.responderalliance.com>

important to diversify funding sources to provide resilience against future fluctuations from any one source.

The study team researched other new funding sources as time allowed. One that seemed promising was to create a BSAR special district to open up new and more effective ways of funding BSAR. Special districts are local governments that provide services or infrastructure to promote the health, safety, prosperity, security, and general welfare of the inhabitants of the district.²⁵ While firefighting makes sense as a special district, there are some challenges when considering a BSAR special district. For one, special districts are pitched where local contributions and investments are paid over time through development and property value increases. It would be tough to make the argument that BSAR impacts these things. Two, there is potential to expand the fire district to add in BSAR, but there are already some disagreements between fire and BSAR. This would likely cause more harm than good.

There is a lot of potential for new and additional funding from the outdoor recreation and tourism industries to support BSAR, as BSAR services directly enable the successes seen in these sectors. However, there is a very clear juxtaposition between the size of some large outdoor recreation gear manufacturers and retailers and the minimal resources of the BSAR teams on which the industry depends. CPW developed a Future Funding Study²⁶ in 2018 to help identify funding strategies for the agency to consider, which included the outdoor recreation industry as a potential source. While there are real challenges to setting up a new funding mechanism in partnership with the outdoor recreation industry (read the Future Funding Study), an effort that would allocate additional funding to BSAR may be more compelling than past efforts to engage the industry in broader outdoor recreation and conservation funding initiatives.

While the new Keep Colorado Pass that's mentioned above will have widespread positive impacts, it can bring additional challenges to consider and address. As we approach 2024 when additional funding will be available to BSAR, there needs to be careful public messaging from all partners. This increased funding won't solve all challenges, so it's recommended to be consistent in communications about the purpose of the new money, and especially, communications about BSAR aspects that still need funding. Additionally, soliciting funding locally may be if donors feel the new state funding is filling funding gaps. It should be shared at these funding events that the goal of the new state funding is not to simply shift funding to state sources, but to maintain and build other sources to increase the sustainability and effectiveness of BSAR teams.

²⁵https://leg.colorado.gov/sites/default/files/2018_local_government_handbook_with_cover_0.pdf

²⁶<https://s31207.pcdn.co/wp-content/uploads/2021/03/Colorado-Parks-and-Wildlife-Future-Funding-Study.pdf>



Photo credit: Colorado Rapid Avalanche Deployment

Recommendations:

- **Move the SAR Fund to CPW**

- While the SAR Fund has been successfully administered by DOLA, the study team researched the potential advantages and disadvantages of moving the SAR Fund to another agency. The study team recommends that CPW administer the SAR Fund going forward for a few reasons. Most importantly, the SAR Fund is currently subject to the Taxpayer Bill of Rights (TABOR) limits as it operates in DOLA, which means that in TABOR refund years funding directed to the SAR Fund results in less money available for other state priorities such as education. However, SAR fund revenue generally comes from fees and donations collected by CPW, which is a statutorily-created TABOR enterprise, and is eligible to be treated as “enterprise cash” if it remains at CPW instead of being transferred to DOLA. What that means is that, by moving the SAR Program to CPW, there will be a greater opportunity to direct new resources to BSAR programs in the future, including implementing the recommendations of this report. This will become even more important as the SAR fund grows to nearly 5x its size when the Keep Colorado Wild Pass starts sending money to the SAR fund.

On top of this important funding advantage, CPW is well-suited to administer and manage funds of this kind. Since 2000, CPW’s Trails Program has distributed over \$140 million for trail grants and capital improvements that benefit year-round trail use, utilizing a funding pool that contains both state and federal sources. There will be other benefits as well, such as having access to CPW’s robust education and marketing departments to help with preventative search and rescue education and awareness of BSAR as an essential service. Lastly, CPW is a statewide agency with staff stationed all across the state, many of whom are already involved in BSAR in their local communities. As other statewide support programs are identified for BSAR, CPW is well positioned to help roll these out and provide support.

- **Seek additional state funding** - The HB 21-1326 General Fund Transfer to the SAR Fund will certainly help teams address immediate demands on top of the annual SAR Fund program. However, this money will be stretched out over many years and won't be able to fully fund some key recommendations made in this report. The Keep Colorado Wild Pass funding will provide good, consistent funding but it won't be available until July 2024 at the earliest. In order to adequately fund key recommendations in this report, additional state funding should be identified to support BSAR teams.
- **Hire a Development Manager** - CSAR should hire a Development Manager to plan out a larger strategy for things like corporate fundraising, membership giving programs, and grant assistance to BSAR teams.
 - **Find leads in other funding studies** - There are many ways (such as lodging taxes) to increase and diversify funding for BSAR. BSAR partners should use funding ideas in reports like Colorado Parks and Wildlife's Future Funding Study from 2018 to help identify top sources/mechanisms to consider. Further insights can be gleaned by studying CPW's successes and challenges while pursuing the recommendations in said report.
 - **Seek philanthropic donors:** Consider approaching philanthropic arms of outdoor industry companies to pursue additional means of support and funding.
- **Continue to engage with new partners** - Over the years, there have been many conversations with Colorado Parks and Wildlife and the Outdoor Recreation and Tourism Industries. While it's good to see that these partnerships are forming, there haven't been any sizable actions or conclusions related to funding. BSAR partners (especially CSAR) should join with CPW in strategizing ways to further engage these large industry partners. Ideas include:
 - Start a new relationship with tourism and outdoor industry partners by requesting in-kind support in the form of marketing, branding, etc. (an easy, entry level of support). BSAR has a great image, so there may be opportunities that improve their branding so it's more of a win-win situation.
 - Work with the outdoor industry leaders and a development manager to map out what a corporate giving program could look like for BSAR. A tiered system could allow for smaller local shops to support at an appropriate level and receive formal recognition from BSAR teams. Also consider expanding to include non-recreation industries like banking and car manufacturers.
 - Consider approaching philanthropic arms of outdoor industry companies to pursue additional means of support and funding.
- **Every dollar (and hour) counts** - As non-profit BSAR team budgets remain small, opportunities to save costs through technical or other in-kind assistance should be pursued. Encourage BSAR volunteers and teams to develop and implement creative cost-saving measures.
- **Pursue federal funding** - Find opportunities to work with firefighters and other emergency response agencies to increase overall federal support for these essential public services. State legislators and CSAR should continue to meet with federal representatives to discuss upcoming legislation that could support BSAR volunteers and teams. Also, be on the lookout for legislation that could hinder or weaken aspects of BSAR.
- **Above all else, keep searching...** - There seems to be no end in sight for the growth of recreation in Colorado's backcountry. Continual efforts to expand and diversify funding will be necessary to keep up and get ahead of increasing BSAR demands.

CHAPTER 4 - INDIVIDUAL AND TEAM EXPENSES

*“Find funding to offset volunteer costs so volunteering just becomes about time”
-BSAR volunteer*

This chapter will focus on the expenses for individual BSAR volunteers and their teams. Below are the specific bill study chapters that will be covered:

- (4) COMPENSATION AND REIMBURSEMENT OF EXPENSES FOR VOLUNTEERS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES;
- (5) THE AVAILABILITY OF NECESSARY EQUIPMENT AND THE NEED FOR FUNDING TO OBTAIN, MAINTAIN, AND REPLACE EQUIPMENT AND OPERATE BACKCOUNTRY SEARCH AND RESCUE TEAMS;

INDIVIDUAL COMPENSATION AND REIMBURSEMENT

Situation:

BSAR Volunteers' Donated Time and Money

Before we discuss individual compensation and reimbursement, it's important to understand how much time and money BSAR volunteers donate. Precisely measuring these individual contributions is challenging as BSAR volunteers are on call at all times, and volunteer hour tracking is not consistently done across BSAR teams. Survey respondents reported participating an average (median) of 53 days per year, with leaders reporting 70 days per year. If we assume that typical BSAR activities (administration, fundraising, maintenance, training, and doing search and rescue) last 4 to 6 hours we can assume that Colorado BSAR volunteers donate approximately 200 to 400+ hours of service per year. For reference, The US Department of Labor reports volunteers spent a median of 52 hours per year volunteering.²⁷ Based on the estimated labor value of \$30.31 for Colorado,²⁸ the value of an individual's donated time and labor is worth between \$6,000 to \$12,000 per year.²⁹ With an estimated 2,800 BSAR volunteers in Colorado,³⁰ volunteers' donated time is worth, at a minimum, \$16.8 million per year.

BSAR members are self-supported as they pay for most of their own expenses to be involved in BSAR. Our survey revealed that one in three (31%) members spends more than \$2000 per year, out of pocket on things such as gear, fuel, and training. This value is likely very underreported, as most teams don't have detailed ledgers of their personal BSAR spending. The mean value spent by all survey responses is \$1587. This means that across the state, BSAR volunteers are donating an estimated \$4.4 million in out of pocket costs per year.

²⁷ https://www.bls.gov/news.release/archives/volun_02252016.pdf

²⁸ https://independentsector.org/resource/vovt_state_2021

²⁹ This number does not include additional time from the ~30 CSAR's State Coordinators across the state that volunteer a minimum of 672 hours additional hours per year.

³⁰ 2021 CSAR estimate

When direct costs are combined with the value of an individual's time, the total tally ranges from about \$7,500 to almost \$14,000 per member, per year. This equates to a total value of \$21 million annually for direct costs and donated time by BSAR volunteers.

Compensation and Reimbursement:

Compensation is a charge for service, whereas reimbursement is a payback for out-of-pocket expenses. Historically, most reimbursement to individual volunteers and teams has come from the Search and Rescue (SAR) Fund administered by DOLA. However, please recall that volunteers donate \$4.4 million out of their pockets every year and the SAR Fund only provides about \$500,000 in support annually, with most of that going to team expenses.

Based on survey results, more than 95% of BSAR volunteers are not paid. We couldn't find data on why the other 5% that said they are paid for their BSAR participation, but the study team assumes that they are likely either paid from services they provide to the BSAR team, such as training, or by another employer for general volunteer work or overlapping work duties.

Some personal property damage may be covered when damaged during an incident response under the authority of the sheriff. This reimbursement money normally comes from the SAR Fund.

BSAR volunteering is costly for individuals. See Table 5 (below) for survey data related to individual expenses for volunteers across three categories. The left column are volunteer leaders that self-identified in the survey (board members, program director, etc.). The right column contains the rest of the volunteers (the field active members). Please note volunteers are likely underreporting their expenses as very few members actually keep detailed records of their time and expenses:

Table 5 - Individual Volunteer Expenses

BSAR Volunteers (Leaders) N=245	BSAR Costs	BSAR Volunteers (Regulars) N=406
87.9 (70)	Time: BSAR days per year – mean (<i>median</i>)	53.2 (40)
\$1907 (\$1000)	Money: dollars spent per year – mean (<i>median</i>)	\$1307 (\$750)
2130 (1000)	*Travel: Miles driven per year – mean (<i>median</i>)	1450 (500)

**For the survey, respondents were asked to include money spent on travel in the "money" column*

We use both the mean and the median above to show that there are some volunteers who contribute a very large amount of time and money to BSAR, which ends up shifting the means (averages) higher than the medians (middle values). However, it's important to use the means when quantifying the total costs (time and money) that volunteers contribute to BSAR.

Additional Individual Support:

Outside support for individual members primarily comes in the form of motivational support from family, employers, and friends who encourage (or tolerate) the member's participation. Outside support is also provided by some outdoor equipment companies that offer discounts to BSAR members when purchasing new gear. The report will address additional means of individual support in the PHYSICAL AND PSYCHOLOGICAL SUPPORT AND RESOURCES chapter below.



Photo credit: Grand County Search and Rescue

Considerations:

Many BSAR volunteers have their own gear. What this means is that volunteers are risking damage and wear to their own often expensive gear. This also means that BSAR is only attracting and retaining volunteers who have adequate gear and financial means, a clear barrier towards diversifying their BSAR teams. Right now, the study team finds that people aren't leaving SAR teams due to reliance on their own gear, but this shouldn't be a cause for complacency on the issue.

Pertaining to our recommendations, it's important to understand that reimbursements can be challenging as they often require the volunteers to keep detailed records, save receipts, and fill out reports. This leads to more administrative work, which has already been identified as a top issue by BSAR team leaders.

The IRS already allows individuals to deduct the cost of equipment used in BSAR and also mileage driven (or actually gas and oil costs). However, the process is not simple nor easy and the recent changes to the tax code make this unreasonable for most BSAR members.

Lastly, the study team found that the individual reimbursement aspect of the SAR Fund is largely underutilized, with approximately \$50K going towards individual reimbursements through the year while approximately \$450K gets divided up and sent to out BSAR teams at the end of the year for different funding purposes (team equipment, training, etc). This appears to be a conscious choice for BSAR teams, who would rather use the SAR Fund for team improvements, versus using it for individual volunteer reimbursements.

Recommendations:

- **Keep the gear aspects of the SAR Fund** - The current model that the SAR Fund has for reimbursing personal gear damage and loss works reasonably well.
- **Mileage reimbursement/stipend** - Consider giving volunteers a mileage stipend and discuss implementation options with BSAR leaders. One idea to consider is using a mileage tracking app along with a volunteer's attestation and team leader approval. This would encourage accuracy, accountability, and data acquisition. Based on the average miles driven per year by surveyed BSAR members (1710), reimbursement for up to 700 miles across 2,800 volunteers would cost approximately \$1 Million.³¹
- **Gear stipend** - A general stipend for gear (up to \$600) may be considered as the federal Consolidated Appropriations Act (2021) gave a permanent extension to the *Volunteer Responder Incentive Protection Act* with up to \$600 being exempt from federal income tax and reporting requirements.³² It is recommended to look into this opportunity further.

³¹ Note: The total figure is based on the State's mileage reimbursement rate of 90% of the IRS prevailing rate per mile.

³² Note: The VRIPA was created to reward "volunteer firefighters and emergency medical responders"; it is uncertain if BSAR volunteers qualify.

TEAM EQUIPMENT

Situation:

BSAR is gear intensive and team equipment is expensive to purchase and maintain, as it must be strong, lightweight, and robust enough for multiple uses in austere settings. Having the right equipment for the job makes operations safer and more efficient for the rescue subjects and the BSAR volunteer responders.



Photo source: CMC³³

Specialized gear is expensive. A single handheld 800MHz radio, \$3000+; a titanium litter (shown above), \$2500+; trail wheel and handles (for litter), \$1300; carbon-fiber toboggan (on-snow rescue), \$4000; vacuum spine board, \$1000; helicopter-rescuer kit (harness, helmet, and radio connections), \$3000; a well-stocked BSAR rescue truck can be equipped with upwards of \$60,000 of equipment (not including radios and the value of the vehicle).

Money to purchase equipment typically comes from a team's general fundraising efforts. Some teams may directly receive funds from their local sheriff/county, or indirectly through their sheriff from the SAR Fund for "big ticket" gear (snowmobiles, \$13,000; OHVs, \$25,000; fleets of radios, \$45,000) (C.R.S. § 33-1-112; C.R.S. § 33-1-112.5). The SAR Fund does not provide funds for items like trucks, buildings, or building improvements. Teams and members also have access to "pro deal" discounts from a variety of manufacturers, which helps to offset the cost of new gear.

BSAR Survey Results

As can be seen in Table 6 (below), slightly less than half of the BSAR teams in Colorado feel they have about the right amount of necessary equipment to complete their BSAR mission. Notably, 46% of small teams and 41% of large teams across the state feel they have less than enough equipment to complete their BSAR mission. Only three teams (one small and two large), feel they have more than enough equipment.

³³ <https://www.cmcpro.com/equipment/titanium-rescue-litter/>

Table 6 - Do you feel that your BSAR team has the necessary equipment to complete its BSAR mission?

	Small Teams	Large Teams
Less than enough	46%	41%
About right	50%	47%
More than enough	4%	12%

Considerations:

In general, equipment that has a manufacturer's expiration date (soft goods such as ropes, harnesses, etc) is not and should not be shared. Knowing the full history of equipment use is very important from a safety perspective. However, gear and equipment that is still safe and in good working condition can be handed down to other SAR teams in need. This can include the "passing down" of large equipment such as trucks and snowmobiles.

BSAR teams are often tax-exempt and are able to purchase items through the "state bid" process, and often do so for radios, vehicles, vehicle parts, etc. However, for small items where fewer are needed (like computers and office equipment), it's usually easier and faster to order from a local dealer, big box store, or online.

As was mentioned in the BSAR TEAM PLANNING AND ADMINISTRATION near the beginning of the report, the lack of regular planning and budgeting is hurting teams' ability to justify and plan for large equipment purchases.

Recommendations:

- **Keep some team equipment purchasing aspects of the SAR Fund** - While it shouldn't be a large proportion, the SAR fund should continue to fund the purchasing of some team equipment. Some teams find that it's easiest to fundraise for items like team equipment (as opposed to paying utility bills or insurance premiums), so some teams would rather have more funding available in other categories. However, some small teams that struggle with local donations and fundraising rely on the SAR fund for the purchasing of essential team equipment.
- **Solicit other ideas to save money on equipment purchasing and maintenance** - Initiate a conversation with outdoor industry gear companies and solicit ideas to lessen the burden of equipment purchasing and/or maintenance for SAR teams.
- **Work with CPW on creative cost-saving measures** - CPW receives bulk pricing discounts through the annual purchase of equipment like snowmobiles, OHVs, and radios. Investigate whether BSAR teams can also take advantage of these bulk purchasing discounts.

CHAPTER 5 - PHYSICAL AND PSYCHOLOGICAL SUPPORT AND RESOURCES

“[We need] the ability to support our team members with mental and physical care. I worry about burn out.”

-BSAR volunteer

This chapter will cover physical and psychological support and resources for BSAR volunteers. It was written by a different study team than the rest of the report (see ACKNOWLEDGEMENTS section above for authors). Please note that this chapter is only a partial summary of a full report, which can be found in APPENDIX E at the end of this report. Below is the specific bill study chapter that will be covered:

(6) THE PHYSICAL AND PSYCHOLOGICAL IMPACTS OF PROVIDING BACKCOUNTRY SEARCH AND RESCUE AND THE AVAILABILITY AND ADEQUACY OF PHYSICAL AND PSYCHOLOGICAL SUPPORT AND RESOURCES FOR INDIVIDUALS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

Situation

Professionals working in BSAR are exposed to traumatic events regularly, leading to increased risk of adverse mental health outcomes, secondary traumatic stress (STS), burnout, and stress injuries. First responders may experience traumatic events that include life-threatening situations, grave injuries, and deaths of colleagues and civilians. They experience taxing work demands with routine exposures to stressors that have been linked to the development of new mental health conditions or exacerbation of pre-existing conditions. There is evidence that mental health conditions are significantly higher among first responders than the general population. There is also evidence of increased burnout and stress injuries linked to work-related exposure to trauma in professionals working with trauma survivors.

Prior to SB 21-145, only anecdotal data were available about BSAR volunteers' mental health in Colorado. We therefore conducted a statewide survey of BSAR volunteers' mental and physical health needs using methods described above. Validated measures were used whenever possible, which allows us to comment on the clinical significance of BSAR volunteers' survey responses, and to compare BSAR volunteers' responses to those of the general population.

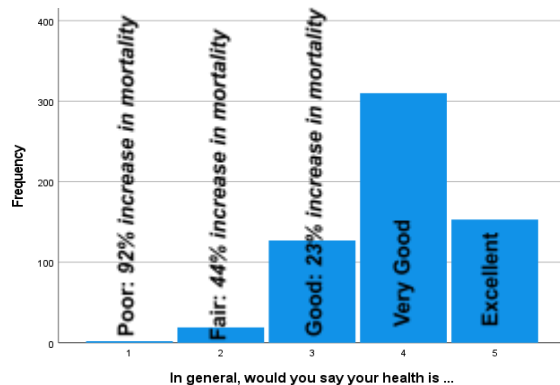
One important challenge in collecting these data was a concern that BSAR volunteers would not be fully honest. This is in part because of the stigma connected to mental health problems, but also because BSAR volunteers who report problems might no longer be considered “fit for duty” by their peers, and might have to give up their BSAR work. Even admitting to physical health problems might therefore involve stigma for BSAR volunteers. To get around this challenge, we administered two sets of parallel items in the survey: One asked whether the BSAR volunteer had personally experienced a problem, and the other asked if they had seen peer BSAR volunteers affected by the problem. The item about peers does not have the same stigma and is therefore considered more accurate. Across two pairs of items, BSAR volunteers reported 18%

more distress on average when asked about peers. In further analyses, we therefore applied a +18% adjustment to survey scores to obtain a more accurate estimate of BSAR volunteers' true results.

We were also tasked with gathering data about the sources of support available to meet BSAR volunteers' physical and mental health needs. We did this through BSAR survey questions; by also surveying community mental health agencies about their current work with BSAR volunteers; and by pilot-testing an online support program for BSAR traumatic stress injury prevention. Results from those questions are also included in this section.

Findings

Physical Health. We asked 2 questions about physical health, both taken from a well-validated measure called the SF-36, which has been shown to predict later health outcomes. When someone says that their health is anything less than "very good" (< 4 out of 5), they have an increased chance of death from any cause over the next five years.³⁴ We found that BSAR



volunteers are generally healthy, with 76% reporting either "very good" or "excellent" health. Overall, this is better than the US population, where only 53% say they are this healthy.³³ However, 20% of BSAR volunteers were at risk for chronic health problems, and 4% were currently in poor health. On a second item from the SF-36, 24% said that their health was either "somewhat worse" or "much worse" now than it had been a year ago. This finding is consistent with the single-item health measure suggesting that as many as 1 in 4 BSAR volunteers is experiencing

worsening health, and may be less able to provide BSAR services in the future.

Burnout. An early warning sign of burnout is feeling less energized or excited about work, based on the "positive experiences" scale of the Maslach Burnout Inventory.³⁵ Using the adjusted numbers, more than two-thirds (68.6%) of BSAR volunteers are at risk for burnout based on a lack of positive work experiences. A second burnout scale, depersonalization, suggests a more severe burnout reaction in which people start to see their teammates or the people they rescue as objects rather than as people. This reaction is connected to trauma and often occurs among people moving into more severe burnout. In our sample of BSAR volunteers, 31.3% reported any experiences of this type, and 14.7% reported moderate to high levels of depersonalization. Compared to the general population, 28.4% report being at risk for burnout, 24.8% experience emotional exhaustion and 14% experience depersonalization in the work environment.³⁶

³⁴ DeSalvo KB, Blosner N, Reynolds K, He J, Muntner P. Mortality prediction with a single general self-rated health question. A meta-analysis. *Journal of general internal medicine*. 2006;21(3):267-275.

³⁵ Bakker AB, Demerouti E, Schaufeli WB. Validation of the Maslach Burnout Inventory - General Survey: An Internet Study. *Anxiety, Stress, & Coping*. 2002;15(3):245-260.

³⁶ Shanafelt, Tait D., et al. "Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014." *Mayo clinic proceedings*. Vol. 90. No. 12. Elsevier, 2015.

Mental Health. We administered the Secondary Traumatic Stress survey to evaluate traumatic stress, the Patient Health Questionnaire 2 to screen for depression, the Substance Use Brief Screen to evaluate alcohol and other substance use, and the Beck Hopelessness Scale to assess suicide risk. All of these are

Mental Health Concern	% At Risk	% w/ Current Problems
Traumatic Stress	30%	10%
Depression	33%	5%
Suicidality	15%	9%
Alcohol Disorder	23%	33%

validated instruments with established cut-off scores for moderate and high mental health risk. Results are shown in the table at right. Overall, 48.6% of BSAR volunteers reported any symptoms that suggested mental health challenges, and 16.2% reported current symptom levels that would likely meet criteria for a mental health diagnosis. Compared to the general population, 21% of U.S. adults experienced any mental illness in 2020 and 5.6% experienced serious mental illness.³⁷ The types of symptoms experienced by BSAR volunteers ranged from depression, to suicidal thoughts, to traumatic stress that manifests as feeling jittery or anxious (10%), avoidance of people or situations (8%), and/or having intrusive thoughts, dreams, or flashbacks (7%). However, the most common problem reported by BSAR volunteers was binge drinking, with 23% reporting that they drank to excess at least once in the past year, and 33% saying that this had happened 3 times or more. Compared to the general population 25.8% of people ages 18 and older reported that they engaged in binge drinking in the past month, and 6.3% reported that they engaged in heavy alcohol use in the past month.³⁸ BSAR volunteers were much less likely to say they used any other form of drugs.

Overlap of Physical and Mental Health. There is some overlap between physical and mental health symptoms among BSAR volunteers. In this analysis we considered only the level of physical or mental health problems that would likely interfere with someone's ability to perform BSAR work – the “current problems” level rather than just “at risk.” The cross-walk of risk factors shows that about 17% of volunteers have current physical health problems that would potentially interfere with their BSAR work, about 11% have psychological problems at a current level of severity that would potentially interfere with BSAR work, about 5% have both types of problems, and about 17% have problematic alcohol use only (defined as 3+ incidents of binge drinking in the past year), which increases their chance for later mental or physical health problems. Only about 50% of BSAR volunteers, then, have no current physical or mental health concerns that might interfere with their performance; the other half of all BSAR volunteers in Colorado may not be at optimal capacity for rescue work due to current, serious physical or mental health concerns.

Considerations

As noted above, BSAR volunteers may be reluctant to seek out support for mental or physical health problems. On survey questions about how they cope with stress, 77% of BSAR volunteers said they exercise and 56% said they seek informal support from others, both of which are healthy strategies. But if these initial strategies fail, BSAR volunteers were then most likely to say that they tried to distract themselves (e.g., watching TV, 40%) or “just tried not to think about it” (26%), both of which are less helpful avoidance coping strategies. Only 11% of BSAR volunteers said they had sought formal mental health support. Changing the culture of BSAR work is important, so that volunteers can acknowledge and receive support for mental health issues.

³⁷<https://www.nami.org/mhstats>

³⁸<https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/alcohol-facts-and-statistics>

Availability of mental health services that can address the unique needs of BSAR volunteers may be a second challenge. Only 35% of sheriff's offices said that they provided mental health support to BSAR volunteers.

Using first responder networks, we identified and surveyed providers affiliated with law enforcement or first responders statewide. In Colorado there are a total of 62 mental health professionals that have indicated that they work with first responders, or about 12.5% of all mental health professionals statewide. Out of the mental health providers identified, 13 (21%) responded to a survey that was sent out to describe the services they offer. Most clinicians who answered the survey were licensed professional counselors (30.8%) and the rest included MD/DO, LCSW, MS/NCC, and licensed psychologists. There was a total of 9 counties represented with the majority based in Arapahoe (15.4%). Police (84%), fire (84%), Search and Rescue (84%), EMS (92%) and healthcare workers (92%) were among the most common first responders they worked with. Clinicians' most common main areas of focus included PTSD, depression, anxiety, trauma, stress management, and substance use / addiction. 92% of clinicians offer tele-health, 15% prescribe medications, 46% are involved in critical incident support following major events in their local area. This indicates that in addition to funding mental health support, increasing access to available providers and training existing providers to meet the unique needs of BSAR volunteers seeking mental health support needs to be an area of focus for future mitigation of stress impact.³⁹

Some of the challenges reported by BSAR volunteers are directly related to resource availability as described in other sections of this report. For example, BSAR volunteers mentioned lack of housing ("living in my truck because of the housing problem here"), personal financial costs ("there are things I need for BSAR work that I can't afford because we don't have a gear allowance"), and health care costs that included veterinary bills for service animals ("a \$16,000 veterinary bill for a rescue dog injured in the line of duty; currently these costs are shouldered solely by the SAR volunteer"). But other significant challenges were non-financial, including conflicts between volunteer BSAR work and paid employment, conflicts between BSAR time and family time, and a feeling of fatigue or exhaustion. BSAR volunteers also said they felt drained by conflicts with agency leadership, other team members, other BSAR agencies, or the public. On the other hand, relationships with other people were also a significant source of satisfaction for BSAR volunteers when things are going well, including teammates, people who are rescued, and a community that recognizes the important role of BSAR volunteers. Other sources of support and satisfaction for BSAR volunteers were the chance to work outdoors (e.g., "the adventure"), the opportunity to learn new skills (e.g., "the dogs teach me so much"), and a sense of purpose (e.g., "it's where God has led me").

Recommendations

The following strategies are recommended to meet BSAR volunteers' identified mental and physical health needs. Additionally, paid staff (sheriffs and their deputies, state agency employees, and other first responders) that are often involved in BSAR would benefit from some of these additional mental and physical health support services. Therefore, we will use the term "BSAR professionals" below to refer to both unpaid BSAR volunteers and paid staff:

- Offer training and screening tools to identify health problems early in BSAR professionals with a clear pathway for ongoing screening, evaluation and BSAR focused care.

³⁹ U.S. Substance Abuse and Mental Health Services Administration. (2022). Behavioral health treatment services locator. <https://findtreatment.samhsa.gov>

- Create networks for social support and additional opportunities for social interaction with peer BSAR professionals. These could be both within and across BSAR agencies; Interagency training has been utilized historically to this end.
- Fund and deliver training programs to identify and eliminate burnout through mental health support, improved communication skills, optimized teamwork, and evidence-based interventions. Recommend annual training budget allotment of \$250K annually to support statewide Stress Injury Awareness (SIA) training, with subsequent peer support training and annual oversight, summits and supportive gear. Training also could include online programs to bolster resilience and prevent traumatic stress, such as the one piloted in fall 2021 with selected BSAR teams. As an example, the cost of the training per rescuer is \$160. The goal would be to train one-third (an estimated 933 volunteers) of the BSAR population annually, at a cost of \$150K annually for the 8-hour stress awareness course. This estimate does not include support for paid agency staff often involved in BSAR. Ongoing costs, once training offered to all existing BSAR volunteers would include leadership training, peer support training and ongoing refresher training
- Offer team-level interventions designed to address the cumulative burden of critical incidents, with a particular emphasis on improving team-level communication and increasing confidence in team leadership. Separate leadership training might also be appropriate to help team leaders meet their volunteers' needs more effectively or to help BSAR volunteers more effectively communicate about and advocate for their work with the public. Estimated cost of annual training is included above in the discussion of BSAR training (\$250K annually).
- Coordinate clinical services from community mental health providers who could be contracted and trained to address the unique mental health needs of BSAR professionals by a "centralized coordinating center", such as the successful hub-and-spoke program in SB 19-001 at the University of Colorado. These BSAR providers should offer a range of formal mental health services that include psychological debriefing, talk therapy (e.g., cognitive-behavioral interventions), and pharmacotherapy. These should be available confidentially and at no cost to BSAR professionals. Estimated annual costs of initiating and maintaining a hub-and-spoke model of statewide support.

It is recommended that this offering exists outside of the traditional workman's compensation model, given the ongoing complexity of fitness for duty, ill-defined pathways for identification and support of occupationally derived psychological injury, and the stigma associated with BSAR volunteers' use of this occupational pathway for mental health support. The formal structure for a fund, foundation, trust, or funded central organization should be identified in the strategic planning phase, using existing and novel examples that have been successful for BSAR volunteers.

Recommend consideration of the hub and spoke model used by University of Colorado for opioid mitigation statewide (SB-19-001), which operates at a starting annual cost of \$400K. This amount accounts for both support of a coordinating center and a pass-through fund to provide resources for utilization of central prescribing and telehealth, and decentralized local support of both therapy, screening, critical incident support and follow-up. This number should grow annually. If one-third of estimated BSAR volunteers participated in 6 sessions of mental health therapy, the cost would be approximately \$560K.

The greater the success of the awareness and stigma-reducing education, the more likely the use of the BSAR focused services, increasing the need for funding over the coming years.

Mental Health Prevention. Prevention and support resources to proactively address stress injuries should be made available to all BSAR professionals in Colorado. This type of broad-based approach is important in preventing “at risk” mental health issues from becoming diagnosable mental health disorders. To test this type of prevention approach, we piloted an online stress injury prevention course and an online support group with BSAR volunteers in fall 2021. At the time of this writing, preliminary results are available for the first group of 29 participants, with more data expected soon. BSAR volunteers in this pilot group said that they had increased capacity to cope with stress after participating in the program, with improvement on all target learning objectives (all $ps < .001$ in paired pre-post t -tests). As an overall rating of the course, 86% of participants said that the online stress injury prevention curriculum had been either “very useful” or “extremely useful.” Perhaps most importantly, the percentage of BSAR volunteers who rated their current level of burnout as either high (“orange” level) or very high (“red” level) on a color-coded continuum dropped from 27% to 20% after participation in the brief online course.

Formal Mental Health Support. The 10-15% of BSAR volunteers who are already experiencing diagnosable mental health disorders need more intensive support than prevention groups, and should be offered counseling, support groups, or pharmacotherapy at no cost. There are a range of evidence-based treatments for depression, trauma, suicidal thoughts, and substance use disorders. CPW should collaborate with CSAR and contract with existing mental health agencies throughout the state to provide this type of treatment locally. It would likely be helpful to have a central coordinating resource for BSAR-focused mental health work, including a toolkit, training, and community of practice. The SB 19-001 opioid MAT project is a useful model for this type of practice.



Photo credit: Summit County Water Rescue Team

CHAPTER 6 - TRAINING

“Teams need to meet basic requirements: Data collected, minimum skills (cpr, bleeding control, ics, etc.) and the skills are current. Raise the professionalism of SAR in Colorado. Create statewide speciality teams that meet certain requirements. Provide consistent services.”
-BSAR volunteer

This chapter will address challenges and complexities related to BSAR training. Below is the specific bill study chapter that will be covered:

(8) TRAINING NEEDS FOR VOLUNTEERS INVOLVED IN BACKCOUNTRY SEARCH AND RESCUE;

Situation:

Having well-trained BSAR volunteers is pivotal to the success of the BSAR system. Generally speaking, most training for BSAR teams in Colorado is conducted using experts within teams, since there are many experienced BSAR professionals volunteering on teams across the state. For training such as medical and first aid, teams will often hire outside professionals. Some teams will also occasionally hire outside professionals to provide specialized training (e.g., avalanche and technical rope rescue).

Funding for BSAR training comes from a couple of main sources. Across the state, a little more than half of the Counties provide training funds for their local non-profit SAR team, according to results from the sheriff BSAR survey. Additional outside funding for training (and equipment) is available via the SAR Fund through an “end-of-year” application process. These funds are available after direct SAR incident costs have been reimbursed to sheriffs. This training aspect of the SAR Fund is of great value for the sheriffs and their local SAR teams.

What does BSAR training entail?

It's helpful to first understand that there are two types of BSAR training - individual and team:

- **Individual training** may include first aid, wilderness living/travel practices, navigation, avalanche awareness, and rock climbing
- **Team training** may include technical rope rescue; search theory, methods, and techniques; communications, and other organizational or system-level practices.

Further, BSAR teams often utilize a framework of knowledge, skills, abilities, and experience (KSAE) in providing training to their members.

- Knowledge – information a member should know or will learn
- Skills – technical or manual proficiencies that are usually learned through training
- Abilities – demonstrable capacity to apply knowledge and skills together to complete a task
- Experience – practical application of abilities over time gained in training situations or real-world actions

The first three elements provide confidence and a level of proficiency for BSAR volunteers. The last element – experience – shows competency.

These topics will be referenced throughout the rest of the chapter.

What is credentialing?

Credentialing is an important topic to understand when considering improvements to BSAR training. Credentialing is the evaluation process of granting formal recognition to (or tracking the status) of individuals, programs, organizations, processes, products, etc. that meet a predetermined and standardized criteria. Certificates, certification, accreditation, licensure, and registration are part of credentialing. Credentialing, when paired with established standards, can help convey a certain level of commitment necessary to being a professional SAR volunteer and raise the standard of BSAR care across the state.

There are a wide array of credentialing entities and specific programs available for BSAR volunteers and their teams. While Colorado does have some credentialing opportunities through CSAR and the Colorado Search and Rescue Conference (SARCon), it does not have a statewide BSAR credentialing system. (other states like CA, OR, WA have statewide credentialing systems). There are a few national programs that offer credentialing, including the National Association of Search and Rescue (NASAR), Federal Emergency Management Agency (FEMA), and the National Mountain Rescue Association (MRA). There are some online training subscription services, such as mountainsafey.info, that are gaining in popularity. Lastly, there are many entities that offer technical programs such as first aid and emergency care, avalanche rescue, rope rescue, etc.

To read more details about BSAR credentialing categories and current offerings, please refer to APPENDIX F.



Photo credit: Vail Mountain Rescue Group

How do BSAR leaders rate their team's training?

In general, leaders on Colorado's BSAR teams rated the quality of the training that their team receives as "good." However, there were appreciable differences between large and small teams where large teams tended to rate the quality as higher than small teams. The study team presumes this is the case since large teams tend to have more missions, gain experience quicker, tend to have more experienced members, and have greater access to resources. Also, on many teams, the leaders had different opinions as to the quality of their team's training. Variance in perceptions between adequate and excellent was not uncommon. In a few cases ratings by leaders on the same team varied from poor to very good.

When asked why current training was inadequate, the most frequent responses from BSAR leaders dealt with available time. Also, high on the list were the lack of expertise and of having an available trainer. Note that the top four reasons all relate to both time and expertise:

Reason	Percentage
Limited time from volunteer trainer	45%
Volunteers don't have time for training	38%
Lack of expertise	34%
No trainer available	30%
Limited funding	28%
Volunteers aren't receptive to training	20%
Unsure what training is needed	18%
Other barrier	11%

In the "Other" category some common themes were:

- Topics not a priority by senior leadership (x4)
- Certifications required but individual members must pay (x2)
- Time (x2): Not enough time for every member to be proficient in every topic
- No cohesive training plan
- Distance: members are spread out over three states

Some BSAR Leaders shared written concerns in the survey as well:

- A concern about "the lack of standardization among training across the state. "
- "There is no way to determine what other teams expect of us. Some teams, not all, only brief things as they come up. Standards are different between teams and sheriff departments. Some sort of baseline beyond MRA needs to be established."

Considerations:

Local factors should impact training scope and intensity. While there are some basic knowledge, skills, and abilities that should likely be consistent across all BSAR teams, each team needs to develop the appropriate scope, intensity, and cadence for their training. For instance, a team along the Arkansas or Colorado River will likely need to train more on swift water rescue where a team with only small seasonal swift water may not train much in this area. Teams at high altitude with sheer rock faces will have different training programs than a lower elevation and

flatter eastern Colorado team. Likewise, teams that are running 10 real technical rescues per month, may need to dedicate less time to basic technical training than a team that only performs 10 real technical rescues in a year.

In-person training is essential but they come with their share of planning challenges. In wilderness and other areas, the USFS may restrict the number of BSAR members that may attend the training. Although more than that number are necessary and allowed when conducting real rescues. By contrast, Colorado State Parks provide free access to BSAR teams for training and these are often attended by CPW rangers. Recreational users may be unhappy with BSAR teams who scare away the game during a search training, monopolize a climbing route for technical training, track up a backcountry ski line for avalanche training, or snowmobile in an area mostly used for cross country skiing. As BSAR teams strive to gain and retain public support for their BSAR work, planning to avoid these situations is important for BSAR teams. Soaring visitation to the backcountry can also make it difficult for teams to simply find places to train, as trailhead parking lots tend to fill very early and specialized training, such as search dog training, is dramatically different in a crowded backcountry area.

Online training is expanding, but remains quite limited and underutilized. Online training are a great way for individuals to acquire knowledge on their own time. Sometimes, though, courses require a strong internet connection making them difficult for folks in more rural areas of the state. Online training examples include: FEMAs ICS-100 and 200, and NIMS-700 level courses. Mountain Rescue Association's Education Basecamp is also available, which provides a few public education and rescuer training courses.

Allowing or encouraging traveling trainers saves volunteer travel time, lodging, etc. CSOC does this and it's very successful for them. Also, in order to be well-rounded BSAR professionals, it's good to understand and consider BSAR perspectives outside of one's own team.



Photo credit: Grand County Search and Rescue

Teams should be aware that more training is not always the answer. There is a natural tendency for teams to add more training, but teams should realistically consider the time needed to set up and participate in training in the context of other core responsibilities (admin, incidents, etc.) Effort needed to plan for and participate in training coincides directly with the number of volunteers. If you have 20 volunteers you may be able to train all at once versus a 30 member team that may require two distinct sessions (more admin, time, cost, etc). Increasing team size does not affect knowledge training, but it does reduce opportunities for skills, abilities, and experience training as there becomes fewer opportunities for hands-on participation. This can reduce performance, capabilities, and ultimately safety. It is easy to add more participants to a knowledge-based training but skills and abilities training require more instructors or additional sessions, and many teams already face limited training time and lack of instructors. Be aware that not all teams may need additional training when volunteers already have adequate training and are limited on time and capacity.

It's hard to find folks with more experience than Colorado BSAR volunteers. There are local companies/groups that can provide technical, avalanche, and wilderness medicine training, but often some of the SAR team members have more experience than the trainer, which has obvious challenges. Also, teams should be aware that typical training consultants only train in only one way to approach situations, when in reality dynamic and different variables warrant the ability to pull from multiple approaches. Strive to choose trainers that present multiple ways to solve problems that can be woven into a team's abilities to improve capabilities.

Colorado BSAR teams have to be very careful when considering "national" standards as they may not apply to Colorado, especially given our vast differences in terrain, high altitude, and extreme weather. A qualified BSAR member in Pennsylvania will be completely out of their element in Colorado. Likewise, a Colorado BSAR member who responds to the high mountains may be completely out of their element if responding to canyon country on the Colorado plateau. To safely and effectively operate in Colorado, BSAR teams have developed local standards, very applicable to their terrain and incident profile. These local standards may not be all that applicable in different regions of Colorado. Right-sizing a statewide minimum standard, is likely in the best interest of Colorado. This would give sheriffs and other responders a baseline standard at which they can expect all BSAR members to safely operate. Many BSAR teams still would and should expand beyond these basic Colorado requirements to fit their situation. For smaller communities, the basic level might be enough and likely could be taught by CSAR trainers. For larger communities, they would likely continue to train in-house and easily fulfill the statewide requirements.

The study team found that credentialing is effective for fire, FEMA, and even for BSAR in some other states. Successes included having additional information at the ready to better enable consistent responses and resource deployment within standard response areas, instances of mutual-aid, and situations that warrant an incident command system (ICS). In the state of Washington, their credentialing and registration system enabled the statewide workers' compensation system, and even rescuers from outside the state can be registered on-site during incident responses.

Lastly, setting a training standard conveys a certain level of commitment necessary to being a professional SAR volunteer and raises the standard of care across the board. SAR team accreditations provide accountability and trust between sheriffs and SAR volunteers. That said, any conversations about credentialing or mandating training for BSAR volunteers needs to address particular concerns that were raised with the study team. Credentialing can be

expensive and time consuming for volunteers who will likely not see a tangible return on their investment to acquire certifications. Increasing standards also increases training and administrative time, and we've heard through the survey that a lack of time is a common challenge for BSAR volunteers. Even the process of staying current with various certifications means additional "refresher" training and testing, which requires time and money.

Recommendations

- **Host a BSAR Credentialing/Training Summit** - BSAR leaders should convene to discuss the potential for a new credentialing/training program for Colorado BSAR by no later than December 1, 2022. Topics to discuss could include:
 - **Credentialing**
 - Baseline core competencies, additional levels of qualifications, distinct levels/tiers, system tracking, ID card system, administering agency, etc.
 - **Training**
 - A new training grant-program similar to Colorado's POST training grant program, a traveling training program led by CSAR, a shared "living" resource directory of programs, training, and certifications, and youth programs similar to Explorer Post and Exploring.
 - **Special considerations should be given to:**
 - The impact on small teams, counties, and groups that are currently struggling with issues such as membership and administrative workload.
 - The wide variety of biomes and terrain seen across the state.
 - Pilot projects with chosen teams before rolling out to the entire state.
 - Implementing a delayed rollout and a window for active volunteers to become current on new standards.
 - Cost and time effective online training vs. in-person training vs. hybrid training
 - Internet bandwidth requirements for online training.

CHAPTER 7 - PUBLIC OUTDOOR SAFETY EDUCATION

Current education for backcountry users "...doesn't identify the real risks of what they are undertaking. Colorado makes high risk adventures seem like carnival rides."

-BSAR volunteer

This chapter will cover public outdoor safety education pertaining to BSAR. Below is the specific bill study chapter that will be covered:

(9) THE NEED FOR PUBLIC OUTDOOR SAFETY EDUCATION.

Situation:

When it comes to public outdoor safety education related to BSAR, the goals are relatively simple:

"Eliminate the avoidable and minimize the unavoidable" - CSAR

While there will always be dangers when recreating in Colorado's backcountry, effective public outdoor safety education can help to prevent the need for BSAR services altogether in certain circumstances. Teaching courses on proper trip planning and the need to modify plans due to changing conditions is one way to prevent BSAR calls. However, even those that are highly trained and experienced can still get into situations where they need assistance, so it should be mentioned that it's unrealistic to think that all BSAR calls can be prevented by some sort of education or safe recreation behavior.



Photo credit: Lake County Search and Rescue

To advance the goal of eliminating the avoidable and minimizing the unavoidable, BSAR teams and their Public Information Officers (PIOs) largely focus on two tasks:

1. Managing media coverage - Most BSAR team PIOs take a similar approach to managing media coverage. They often have one or a couple spokespeople that bring consistency to incident reporting. Most monitor incident coverage closely on social media for areas of falsehoods and misbeliefs, and they often strive to include at least one relevant public education point related to each incident. The amount of coordination and oversight from counties on items such as SAR incident press releases varies from county to county, with some BSAR PIOs playing a supportive role for the counties while others have more autonomy to write and finalize press releases about BSAR incidents.

2. Expanding preventative search and rescue efforts - Known as PSAR (pronounced pee-sar), preventative search and rescue is a concerted effort to educate and train the public about safe recreation behaviors in order to prevent the need for search and rescue assistance. Approaches to PSAR varies across teams, with many reposting messages and resources from trusted partners. Other teams connect more intimately with the public through free in-person classes in the spring (to prepare for summer recreation), and the fall (to prepare for winter recreation). Pre-COVID, these classes were very well received with some teams in close proximity to large metropolitan areas having anywhere from 6 to 40 members of the public attend. Other teams that we spoke to had challenges with getting the public to participate in PSAR events. Below are some specific Colorado examples of BSAR-related events and campaigns.

ABC's Week: In the late 1980s and early 1990s, Colorado enjoyed a statewide public avalanche safety program—Avalanche Backcountry Safety Week (ABC'S Week) that was organized by the Colorado Search and Rescue Board.⁴⁰ The effort was organized in response to the winter of 1986–87 when 11 people died in avalanches—almost four times the average of the previous 20 years. The CSRB provided support and assistance as well as tools for local mountain search and rescue teams and selected US Forest Service Ranger Districts across Colorado to conduct their own outdoor public safety programs. “Media and Material Kits” were compiled and contained television- and radio-ready programming, print-ready stories, along with an avalanche awareness video and a lecture outline and script for a one-hour presentation. Volunteers in the BSAR community donated their time and energy to organize and manage the event. Hard costs for the program tallied \$1500; however, donated time for production work (namely graphic artists and advertising professionals) was valued at over \$5000. KUSA (TV) volunteered production and airing costs of a variety of public safety announcements (PSAs) valued in the tens of thousands of dollars. In today's dollars the cost of the program would likely be at a minimum of \$100,000. The program ran statewide for about three more years, before fading away from fatigued volunteers. Locally in the Denver metro area, ABC'S Week continued into the mid-1990s before quickly ending. The success of the program could never be accurately measured because the number of backcountry users was not known then (and is still not known today). The program did become a model for similar—but smaller—public avalanche awareness safety programs in the US, Canada, and France (Atkins, 1988).⁴¹

⁴⁰ CSRB is now known as the Colorado Search and Rescue Association (CSAR)

⁴¹ <https://arc.lib.montana.edu/snow-science/objects/issw-1988-187-192.pdf>

Colorado Backcountry Winter Safety Awareness (2020–21): This winter-long initiative was developed as a collaboration between three state agencies – the Colorado Tourism Office (CTO), the Colorado Office of Outdoor Recreation Industry (OREC), and Colorado Parks and Wildlife (CPW) to reduce pressures on natural resources, BSAR, and rural public health systems already stressed by the COVID-19 pandemic. Other partners included the CAIC, CSAR, BLM, and USFS. The program included a micro website dedicated to winter safety,⁴² short videos,⁴³ and a donation campaign for CSAR. Future plans to revive the program.

Trailhead Itinerary Card Program: Alpine Rescue Team currently partners with the Clear Creek County Sheriff's Office to provide 5x8 cards at popular trailheads. On one side of the cards contains recreation guidelines such as the list of the 10 essential items to bring with you, both in winter and summer. The other side asks for your basic itinerary, clothing, and other essential trip details. Then, it's recommended that you put this card on your windshield (with your personal details face down), so that a law enforcement officer can enter your vehicle to seek out additional details should you run into trouble on your recreation adventure. This is a creative partnership that has many benefits:

- It takes a low amount of effort to implement - stocking paper cards at trailheads
- BSAR teams and their sheriffs can learn important details early on in a search and rescue response that may improve the outcome
- It gets the public in the mindset of sharing essential trip information to others, and may be something they may begin practicing with friends and family members.

To date, the county has dispenser boxes at 11 popular trailheads and has distributed about 10,000 cards since the project's inception in 2015. To date, there has not been a known instance when a card was accessed by a law enforcement officer. While the card has not yet been used directly to aid a SAR incident, the card also teaches people about a dimension of trip planning – sharing one's trip plan with others – that most have never considered. Such an action greatly aids BSAR teams when they know the details of one's plan.

Hunter Safety Programs: Education programs, like CPW's, have been shown to be effective at reducing shooting accidents, improving behaviors, instilling ethics and responsibility. The programs go a long way toward educating hunters to have safe, successful, and fun outings; such outcomes are the same desired by BSAR teams for backcountry visitors. Hunter safety programs work – not just because of their quality content and excellent instructors – but also because a certificate of completion is required by everyone born after 1948 to apply for a hunting license. To implement a similar program for backcountry recreation would be unprecedented and monumental.

Colorado Fourteeners Initiative (CFI) Videos: In 2010 the CFI started using short Youtube videos⁴⁴ to deliver messaging about their mission and activities. Over the years they expanded the series to include 34 safety and education films running about 3 to 4 minutes (a few are closer to 12 minutes). The videos have been watched a combined 167,867 times. Total costs are \$46,801; including in-kind time by the CFI executive director for some early videos in the series means a total cost of about \$50,000. This works out to about \$1470 per video and about 30 cents per view.

⁴² <https://www.colorado.com/winter-backcountry-safety>

⁴³ <https://youtu.be/r4P8geHGTMs>

⁴⁴ <https://www.youtube.com/user/CO14ersInitiative>

Considerations:

Only about 30% of BSAR volunteers and sheriffs say that public outdoor safety education is “good” or better. Top challenges to more effective public outdoor safety education include volunteer/staff capacity, a downward trend in mentorship, and tracking the impacts of education efforts.

More often, smaller BSAR teams may only have one volunteer working on all of the above communication and education duties. Due to overlap, some PIOs also lead fundraising efforts which adds to their workload. A few teams have a few dedicated positions that perform PSAR activities, but these teams are the exception. Over the past few years, PIOs at CSAR have worked in partnership with others to improve public safety messaging through social media and traditional media.

There is a sentiment that there is becoming less and less reliance on (and potentially availability of) mentors to introduce new people to backcountry pursuits. In the past few decades, expansion of information available on the internet and the ability to purchase and use highly specialized gear without a mentor is changing how people recreate. This also creates the need for new methods to educate these non-mentored recreationalists. In Europe, mountain guides are employed far more often and regularly than guides in Colorado (and the United States). Guides serve as mentors to teach and share safe outdoor recreation behaviors.

Considering the increases that we’re seeing in Backcountry recreation, membership of mountain clubs that provide training and education remains largely the same. By comparison, some European countries of comparable size to Colorado have 10-15x times more members of mountain clubs. With more members, these clubs have larger reach, data, and budgets, which enhances the effectiveness of their PSAR education and training. The Colorado Mountain Club offers a host of outdoor and mountaineering classes and leads a large number of outings, all at a very reasonable cost to members. If they had the same proportionate membership as some of these active European countries, PSAR education would be much more effective.

Safety is a difficult message to attract outdoor users as most people do not think they will have an accident. The most important messaging on how to recreate safely in the backcountry largely stays the same each year. Trying to provide education that isn’t too preachy and also isn’t too repetitive (or presented the same way), over time is a challenge for BSAR team PIOs. One survey shared praise for the improved avalanche information sharing that they’ve been seeing: “I have seen in recent years more of a focus on avalanche conditions on the electronic signs on the highways and local newscasts ... love to see that.” -BSAR volunteer

Some teams host free public safety evenings on all sorts of topics (mountain weather, lightning, avalanches, climbing 14ers, etc.). Because of limited seating capacities, signups are required, which often fill, but relatively few actually show up for the free presentation, even when presented virtually.

Most BSAR teams have no or relatively simple methods for tracking the success of their PSAR education activities. Connecting educational efforts to on the ground effects (such as the reduction in the number of calls), is difficult to do and requires additional data and resources. Some work is being done by CTO, CPW, and CSAR to use data collected from internet usage to track interest by the public in these safety messages but it is not currently being used to inform an overall picture of education efficacy.

Because BSAR is such a complex web of partnerships (see Figure 2 on Page 20) and it operates differently depending on the area and complexity of the incident, many people, including those in BSAR do not understand fully how it works. This becomes a challenge when PIOs try to explain incidents on social media and to the public. Oftentimes they're fighting disinformation, which is challenging when the system is not well understood even by well-intentioned members of the public and/or media.

Recommendations:

- **Develop public-facing decision-making aids** The state could work with CSAR to develop an online guide/aid, similar to AdventureSmart,⁴⁵ that will give detailed information on how to make smarter backcountry decisions. In Canada, AdventureSmart is a national program (includes a trip-planning app) dedicated to encouraging Canadians and visitors to Canada to "Get informed and go outdoors". AdventureSmart balances key safety messages with an individual's responsibility for safety; encouraging the public to obtain the knowledge, skills and equipment necessary for them to enjoy their outdoor pursuits. By being AdventureSmart, outdoor recreationalists make informed decisions, *reducing the frequency, severity and duration of search and rescue (SAR) incidents.*
- **Develop plug-n-play internal toolkits** - The state could fund or provide staff to create a free statewide toolbox of premade professional PSAR education materials, with messaging, graphics, and videos that are applicable to anywhere in the state. This would especially help the smaller teams that have limited PIO capacity.
- **CSAR and BSAR teams should join existing statewide education coalitions** and campaigns like Care for Colorado,⁴⁶ which mirrors many elements of the successful education campaigns mentioned above.
- **Continue to improve outdoor maps and descriptions of recreational assets** (online trail hiking information) to provide better accuracy and portrayal of dangers. Begin by working with the mediums that receive the most traffic (people) whether that be on the web, print, or in person. If warranted, consider going through CSAR and the state for a more substantial and professional request to the larger companies/websites.
 - Encourage appropriate use of electronics in the backcountry and use of trusted recreation apps such as the Colorado Trail Explorer App (COTREX)⁴⁷ and Overdue.
- **Convey realistic expectations** - Many PIOs that we talked to expressed a desire to be more transparent with the public about BSAR services, in an effort to set up more realistic expectations and possibly change recreation behaviors. For example, one survey respondent recommended that messaging should convey "...how long response times are".
- **More face-to-face education:** While there are many ways to reach the public these days virtually on cell phones and computers, face-to-face education is still a powerful tool for PSAR. In this context, there are a few ways that BSAR can strengthen their education work:
 - Develop partnerships with and promote mountain clubs like Colorado Mountain Club (CMC).

⁴⁵ <https://www.adventuresmart.ca/>

⁴⁶ <https://www.colorado.com/CareForColorado>

⁴⁷ <https://trails.colorado.gov/>

- Advocate the use of certified mountain guides whose code of ethics and conduct emphasize risk management, assisting others in need, and respecting the environment.
 - Encourage land managers to streamline the approval for certified mountain guides.
- Provide more education for “schools and point of contact sales”, as one survey respondent recommended.
- Work with partners that have trailhead ambassador programs to ensure that they adequately understand safe recreation behaviors, and can convey these to the backcountry users in a friendly and informative manner.
- **Encourage new and more creative ways to portray BSAR activities** to the public for better public understanding. Including new/additional partners (such as with local outdoor gear manufacturers and retailers, and their influencers), will help to fuel new ideas and approaches.
 - The Crestone Needles Rescue Mapping Project is one example of a new and creative way to tell the story of BSAR in Colorado.⁴⁸
- **Use data to improve PSAR** - As more consistent and detailed incident data is collected (see section below), use this data to evaluate “hot spots” of similar incidents to determine if other prevention methods, like increased signage, can help to reduce call volumes.



Photo credit: Search and Rescue Dogs of Colorado

⁴⁸ <https://storymaps.arcgis.com/stories/1f6b78256d604dc5a7d285d659252189>

CHAPTER 8 - DATA COLLECTION AND REPORTING

*“Improve records management and utilize what data is collected.”
-BSAR volunteer*

This chapter will cover data collection and reporting. It is an additional topic that was added by the study team due to its importance.

Situation:

Generally, data is collected and used by search and rescue partners for three main purposes: preparation, response, and evaluation. Across the state, many different platforms are used for these purposes including the CSAR annual survey, D4H, Salamander, the SAR Fund reporting form, SARTopo, WebEOC, and other local tools.

When asked if a statewide standardized system to collect BSAR data (membership, training, incidents, etc.) would benefit the BSAR community, 58% of BSAR leaders said yes, 4% said no, and 39% were not sure. One BSAR leader summarized a few specific data challenges:

“The number of times that [our] team is required to enter stats is horrible. We do our own mission reports, then another no-standard and always changing stat input for CSAR that doesn't match our own stats, and then ANOTHER required stat input for MRA which doesn't match either of the prior stat inputs. Our group gets chastised for not entering our stats, but we have our own, and to ask an all-volunteer group that is responding to 200+ missions this year to spend HOURS putting this information into 3 systems is ridiculous.”

Why collect data?

Preparation - Teams need to know what assets they have in order to effectively respond to and manage BSAR operations. Collecting and analyzing data on response history, equipment, individual volunteer credentials (level of training), costs, etc. can help identify team strengths and weaknesses, as well as opportunities and threats. It also provides easily accessible information to assist with budgeting and planning for equipment replacement, vehicle maintenance, and credentialing/re-credentialing requirements.

Response - Using data compiled in the “preparation phase”, details and changing situations about responses are added to a program such as D4H or WebEOC to assist with asset deployment and tracking of incident personnel. Having quick access to and manipulation of certain data fields is essential for efficient and effective responses out in the field. Having this information available to mutual-aid responders from other BSAR teams increases situational awareness and reduces response times.

Evaluation - From incident debriefs to grant reporting, evaluation is important for operational improvements as well as tracking long term BSAR trends such as incident response type.

While teams may locally collect and report data for the above purposes, having consistent reporting and tracking statewide across certain data fields may be necessary in order to create and implement statewide support programs (such as a statewide BSAR volunteer workers' compensation program). The two ways to do this are: 1) use of one single collection platform or 2) merging of data sources from multiple platforms.

Considerations:

Collecting and using data for incidents and evaluation purposes has huge potential to improve incidents and reduce future incident loads, especially in a world where phone and internet connectivity are constantly improving. However, data driven decision making is a relatively new concept for BSAR. While some teams have been collecting and using data for some time, many do not have the time, energy, and expertise to implement effective ways to collect data across their team. Therefore, utilization of data to inform decision making is a relatively new concept for many.

The purpose of data collection is to turn data into information. To do this requires identifying a data goal (ie - how it will be used and why?). Incident data, which can be used for evaluation purposes, is the most consistent type of data collected across teams. However, even this has some reporting challenges such as duplication and inconsistent tracking of hours (ie - when do incidents officially start and end?). Reporting on non-incident data and administrative hours is very inconsistent across teams.

As mentioned above, BSAR partners use a variety of tools to collect and report data, depending on their needs. WebEOC is valuable for large and complex incidents, and is frequently used in all hazard disaster emergency events. Salamander is another large platform used for credentially and ID cards. DOLA collects data related to the funding it administers. D4H works well for BSAR teams because it collects internal information that can directly improve team performance, but isn't and likely won't be adopted by other important partners (firefighters, state emergency managers, etc.) Outside of Colorado, the national Mountain Rescue Association (MRA) asks for different annual data than CSAR does, adding to reporting complexities. The WebEOC and Salamander platforms complement each other and their data can be integrated. However, to our knowledge, there are limited connections between the other various collection tools and data platforms. D4H has committed to exporting the MRA requested data.

Current BSAR usage across current platforms:

- D4H - About 10 BSAR teams are using the D4H application.
- WebEOC - 1 or 2 BSAR teams are using WebEOC to track time spent by members.
- Salamander - Used by some BSAR teams.
- DOLA SAR Reporting - Most BSAR teams.
- CSAR annual survey - Roughly 55% of the teams

Similar to the differences between the state and CSAR/teams, there are many different law enforcement tools being used across the state. However, there seems to be slightly more connection between law enforcement tools when compared to the BSAR tools that are available and being used.

Volunteers are unlikely to spend time submitting incident information into an ancillary database unless there is funding tied to it. Teams are asked and sometimes required to submit data and complete reports for many partners, including but not limited to: training requirements, mileage, hours, DOLA reporting form, local press release, USFS incident form, USFS death form, equipment use within wilderness, helicopter landings, their own team reports, communication logs, maps, Incident Command System (ICS) 214 activity log, etc. Considering that multiple incidents can happen on a busy day, the time needed for proper reporting is substantial.

Another data challenge is the “chicken and the egg” scenario. Patchy and inconsistent data collection within teams and across the state makes analysis of that data difficult and not as meaningful. It’s also hard to convince teams and volunteers that data can help improve BSAR efficiency, when the data to prove this isn’t adequately collected.

Lastly, there is a philosophical question about who should own and have access to full datasets, including personally identifiable information on volunteers and subjects. Patient information collected by BSAR teams may be protected by HIPAA. Such information, if collected and stored digitally, has strict requirements for security. Meeting the requirements is burdensome and requires a separate record system. Additionally, because of the Colorado Open Records Act, data collection tools should be thoughtfully designed so there are easy and clear ways to share appropriate data when requested.

Recommendations:

- **Hire a Data Analyst** - Having a paid data analyst would be one of the best ways to improve data reporting and analysis. The state should fund a BSAR data analyst to improve data accountability, consistency, and analysis of trends to better identify potential BSAR improvements as well as more effective prevention measures, such as site specific signage.
- **Host a BSAR Data Summit** - BSAR partners should host a summit to discuss which data is most important to collect, how to define each data item, and what format each should be in. For example, if time devoted to incidents is important to know within and across teams, define when incidents start and end to ensure data collection consistency by all partners. It will be important to include many partners in this summit, in order to maximize data consistency and streamline potential reporting improvements. Pay particular attention to what can realistically be captured by BSAR volunteers who have limited time and capacity. It is not important, as a first step, to determine the exact reporting tools that are needed to collect this data. This summit should take place no later than December 1, 2022.
 - Outside of Colorado, CSAR should work with the Mountain Rescue Association (MRA) to streamline data collection (potentially into one tool), so MRA accredited teams don’t need to report similar data separately to two different places.
- **Integrate datasets and collection platforms** - Once the most essential data to collect is established and agreed upon (at the retreat), research the potential to connect data from existing tools (mainly D4H, Salamander, and WebEOC) that would allow partners to use their preferred platforms while still achieving shared data goals.

CONCLUSION

The Colorado BSAR system is effective because of its strong and willing partners. Sheriff's lead the way with essential knowledge and authority, volunteers step up to execute incident objectives, and the state's funding supports teams' safety, preparedness, and efficiency.

While our recommendations point to improvements to certain areas in the current system, what won't change is the continued reliance on partnerships for BSAR success in Colorado. The United States National Search and Rescue Supplement to the International Aeronautical and Maritime Search and Rescue Manual concludes that:

"The most important lesson to be learned concerning the cooperation, coordination, and conduct of SAR is that no single Agency or organization can go it alone. Lifesaving is a team effort. Federal SAR agencies must work with other organizations to effectively save lives both in the U.S. and globally. With limited budgets, personnel, and training, SAR agencies and organizations must work together to save lives in the 21st century."⁴⁹



Photo Credit: Alpine Rescue Team

Study Team Reflections:

Gleaned through the conversations and research, the study team would like to share a few items with the reader. One, we found that there is often more commonality than difference both between and within BSAR teams. Groups often perceive that their challenges are so unique that others can't understand them. In reality, their issues overlap with others more than they realize and solutions would be better addressed through cooperation. For example, small teams may not have enough team members for one regular incident while large teams may not have enough to support multiple incidents happening at once. However, both teams are facing similar issues. Both share a need for additional trained members in a world of growing BSAR calls.

⁴⁹UNITED STATES NATIONAL SEARCH AND RESCUE SUPPLEMENT to the International Aeronautical and Maritime Search and Rescue Manual - 2018

We also came to the determination that BSAR is an essential service. Similar to fire, EMS, and other emergency services, BSAR is vital to the health and wellbeing of both residents and visitors. This has been very evident during the pandemic when backcountry use skyrocketed from people seeking an escape and solace. However, BSAR is well behind those other emergency services in terms of financial and legal support.

NEXT STEPS

There are recommendations above to identify paid staff support in a few key areas, as well as a leading agency/group to convene BSAR stakeholders to discuss particular issues in more detail. Most, if not all of these duties should be fulfilled by the state in partnership with other stakeholders in the BSAR working group, including CSAR. We recommend that these partners sit down and map out the roles and responsibilities as to which recommendations each partner will lead. Further, some issues such as the State SAR Coordinators may warrant written documentation and formalized roles and responsibilities.

For complex topics such as workers' compensation, it's recommended to consult with subject matter experts to further understand the specific challenges facing BSAR volunteers and recommend appropriate next steps.

There are a couple of recommendations above to host "BSAR Summits" on complex issues that warrant additional research. There is an opportunity to continue the BSAR Workgroup and assign these tasks to them. The study is also certain that new BSAR challenges will continue to present themselves and it will take a diverse group of leaders like the BSAR Workgroup to identify them early and work together to address them.

The study team recommends that this report be presented to a variety of audiences to broaden awareness of BSAR issues and garner support for improvements. Here is a list of recommended groups:

- Colorado Counties, Inc. (CCI)
- Colorado Department of Natural Resources (DNR) EDI Working Group
- Colorado Outdoor Partnership (CO-OP)
- Colorado Outdoor Recreation Advisory Council
- Colorado Parks and Wildlife Commission
- Colorado Search and Rescue Association (CSAR)
- Counties & Commissioners Acting Together (CCAT)
- County Sheriffs of Colorado (CSOC)
- Federal agency partners (BLM/USFS/NPS)
- Great Outdoors Colorado (GOCO)
- Inter-Agency Conservation and Recreation Council
- Outdoor Equity Fund Board at CPW
- Outdoor Industry Association/Outdoor Retailers Conference
- The Colorado Delegation of Federal Legislators

APPENDICES

APPENDIX A

Senate Bill 21-245: Backcountry Search And Rescue In Colorado

SECTION 3:

33-10-116. Backcountry search and rescue - study - training and physical and psychological support pilot program. (1) (a) THE DIVISION SHALL CONDUCT A STUDY AND DEVELOP RECOMMENDATIONS ON HOW TO ADDRESS THE CHALLENGES ASSOCIATED WITH BACKCOUNTRY SEARCH AND RESCUE IN THE STATE. AT A MINIMUM, THE STUDY MUST ADDRESS: PAGE 3-SENATE BILL 21-245

(1) HOW TO IMPROVE AND DEVELOP A SUSTAINABLE STRUCTURE FOR COORDINATION AMONG THE STATE OF COLORADO, COUNTY SHERIFFS AND LOCAL LAW ENFORCEMENT AGENCIES, PUBLIC OR NONPROFIT ORGANIZATIONS THAT PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, AND FEDERAL AGENCIES;

(2) THE AVAILABILITY AND ADEQUACY OF WORKERS COMPENSATION OR OTHER BENEFITS FOR INDIVIDUALS WHO ARE INJURED IN THE COURSE OF PROVIDING BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

(3) THE AVAILABILITY AND ADEQUACY OF RETIREMENT BENEFITS FOR INDIVIDUALS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

(4) COMPENSATION AND REIMBURSEMENT OF EXPENSES FOR VOLUNTEERS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES;

(5) THE AVAILABILITY OF NECESSARY EQUIPMENT AND THE NEED FOR FUNDING TO OBTAIN, MAINTAIN, AND REPLACE EQUIPMENT AND OPERATE BACKCOUNTRY SEARCH AND RESCUE TEAMS;

(6) THE PHYSICAL AND PSYCHOLOGICAL IMPACTS OF PROVIDING BACKCOUNTRY SEARCH AND RESCUE AND THE AVAILABILITY AND ADEQUACY OF PHYSICAL AND PSYCHOLOGICAL SUPPORT AND RESOURCES FOR INDIVIDUALS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES, INCLUDING AS VOLUNTEERS;

(7) ISSUES RELATED TO GOVERNMENTAL IMMUNITY FOR VOLUNTEERS WHO PROVIDE BACKCOUNTRY SEARCH AND RESCUE SERVICES;

(8) TRAINING NEEDS FOR VOLUNTEERS INVOLVED IN BACKCOUNTRY SEARCH AND RESCUE; AND

(9) THE NEED FOR PUBLIC OUTDOOR SAFETY EDUCATION.

(b) IN CONDUCTING THE STUDY REQUIRED BY THIS SUBSECTION (1), THE DIVISION SHALL CONSULT WITH AFFECTED STAKEHOLDERS, INCLUDING COUNTY SHERIFFS, PUBLIC AND NONPROFIT BACKCOUNTRY SEARCH AND RESCUE ORGANIZATIONS, THE DEPARTMENT OF PUBLIC SAFETY, THE DEPARTMENT OF LOCAL AFFAIRS, THE COLORADO AVALANCHE INFORMATION CENTER, LOCAL GOVERNMENTS, AND OTHER ENTITIES AFFECTED BY OR INVOLVED WITH BACKCOUNTRY SEARCH AND RESCUE.

(c) THE DEPARTMENT SHALL REPORT ON THE DIVISION'S FINDINGS AS PART OF THE DEPARTMENT'S "STATE MEASUREMENT FOR ACCOUNTABLE, RESPONSIVE, AND TRANSPARENT (SMART) GOVERNMENT ACT" HEARING REQUIRED BY SECTION 2-7-203 IN JANUARY 2022 TO THE RURAL AFFAIRS AND AGRICULTURE COMMITTEE OF THE HOUSE OF REPRESENTATIVES AND THE AGRICULTURE AND NATURAL RESOURCES COMMITTEE OF THE SENATE, OR THEIR SUCCESSOR COMMITTEES.

APPENDIX B

BSAR Summit Notes Monday October 25th, 2021

What are the key aspects of a sustainable BSAR structure in CO?

Structure

- Strike a balance of centralization and decentralization for both consistency and flexibility.
- Overall structure is simple enough to describe
- Training is consistent, centralized, and tracked well
- Use the same scalable tools when appropriate
- Streamlined communication between BSAR stakeholders

Support

- Secure adequate funding from all beneficiaries, including user groups and the outdoor rec industry
- Diversify funding to mitigate risks
- Administrative work is well supported, and potentially paid
- Mental health for BSAR has its own specific language and approach to care

BSAR Teams

- Build capacity, exit plan, and succession planning for volunteers
- Widespread coverage of active and staffed BSAR orgs across CO

APPENDIX C

BSAR Volunteer Survey

The following teams (49) responded to the volunteer survey:

Alamosa Volunteer Search & Rescue	Alpine Rescue Team	Arapahoe Rescue Patrol, Inc.	Archuleta County Search & Rescue	Boulder Emergency Squad
Chaffee County SAR - North	Chaffee County SAR - South	Colorado 4x4 Rescue and Recovery	Colorado Forensic Canines	Colorado Rapid Avalanche Deployment
Crested Butte Mountain Rescue	Custer County Search & Rescue	Delta County Search & Rescue	Diamond Peak Ski Patrol	Dolores County Search & Rescue
Douglas County Search & Rescue	El Paso County Search & Rescue	Fremont Search & Rescue	Front Range Mine Rescue Team	Front Range Rescue Dogs
Garfield County Search & Rescue	Grand County Search & Rescue	Hinsdale County Search & Rescue	K-9 SAR Team, Inc.	La Plata County Search & Rescue
Lake County Search & Rescue	Larimer County Search & Rescue	Mesa County Search & Rescue Ground Team	Moffat County Search & Rescue	Montezuma County Search & Rescue
Montrose County Sheriff's Posse	Mountain Rescue Aspen	Ouray Mountain Rescue Team	Park County Search & Rescue	Pueblo County Sheriff's Office Search & Rescue
Rampart Search and Rescue	Rio Blanco Search & Rescue	Rio Grande Search & Rescue	Rocky Mountain Rescue Group	Routt County Search & Rescue
San Juan County Search & Rescue	San Miguel Search & Rescue	Search and Rescue Dogs of Colorado	Summit County Rescue Group	Teller County Search & Rescue
Upper San Juan Search & Rescue	Vail Mountain Rescue Group	West Elk Mountain Rescue	Western Mountain Rescue Team	

APPENDIX D

Sheriff BSAR Survey

The following sheriff's offices (41) responded to the sheriff survey:

Archuleta	Baca	Boulder	Chaffee	Clear Creek	Conejos
Costilla	Custer	Delta	Dolores	Douglas	Eagle
El Paso	Elbert	Fremont	Garfield	Gilpin	Grand
Gunnison	Hinsdale	Jackson	Jefferson	La Plata	Lake
Larimer	Logan	Mesa	Mineral	Moffat	Montezuma
Otero	Ouray	Phillips	Prowers	Pueblo	Rio Blanco
Routt	Saguache	San Juan	Summit	Weld	

APPENDIX E

Strengthening Backcountry Search and Rescue: A Cross-sectional Analysis on Mental Health Outcomes and Services in Colorado

William Mundo MPH^{1,2}, Paul Cook PhD³, Laura McGladrey MSN RN³

¹ School of Medicine, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

² School of Public Health, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

³ College of Nursing, University of Colorado Anschutz Medical Campus, Aurora, CO, USA

Colorado Senate Bill 21-245 Overview

This bill develops a definition for backcountry search and rescue (BSAR) in statute and requires implementing a study and stakeholder process to address numerous issues with the existing volunteer-based BSAR program and provide policy recommendations. The bill will also address immediate needs for BSAR organizations by creating a pilot program to provide mental health services to BSAR responders.

Context to the study

- 92% of Coloradans recreate outdoors, and 62% recreate in parks, trails, and open spaces one or more times a week
- BSAR organizations respond to 3,600 search and rescue incidents a year – more than any other state
- Only state funding support for BSAR is \$350k annual grants from the Department of Local Affairs' SAR fund
- There are roughly 2,800 unpaid BSAR responders who serve on almost 50 non-profit BSAR teams and give over 500,000 person hours annually
- BSAR volunteers receive no compensation, healthcare, or mental health services for the work they provide to the state

Summary of findings

- 1 in 4 BSAR volunteers experiencing worsening health
- 20-25% of the current BSAR workforce will need to be replaced within the next five years
- 2/3 of BSAR volunteers are at risk for burnout
- 1/3 of current BSAR volunteers have some level of burnout
- 1 in 10 BSAR volunteers' level of burnout is likely to have meaningful consequences
- 1/3 of BSAR volunteers reported some level of intrusive experiences
- 9.6% of BSAR volunteers are at risk for suicide
- More than 1/2 of BSAR volunteers have potentially problematic drinking
- 27.1% of BSAR volunteers felt like leaving
- 19.8% said they did not feel supported by leadership
- 15.8% of BSAR volunteers said they mostly did not feel prepared
- 10-33% of BSAR volunteers need immediate mental health support
- The primary supports needed by BSAR volunteers are 1) Financial support (37%), 2) Leadership or training (25%), 3) Team-building (24%), 4) Mental health support (22%)
- Online education and support groups improved mental health among BSAR volunteers

Background

As the state's population increases at an unprecedented rate, Colorado's Backcountry Search and Rescue (BSAR) system faces new and demanding challenges. BSAR is often dangerous, and the volunteers receive no compensation, healthcare, or mental health services, despite the distinct possibility of personal injury and impacts to mental health from witnessing extreme trauma or death. Professionals working in BSAR are exposed to traumatic events regularly, leading to increased risk of adverse mental health outcomes, secondary traumatic stress (STS), burnout, and stress injuries.¹⁻⁵

First responders regularly experience traumatic events, including life-threatening situations, grave injuries, and deaths of colleagues and civilians.^{3,4,6} They experience taxing work demands with routine exposures to stressors that have been linked to the development of new mental health conditions or exacerbation of pre-existing conditions.^{1,2,6-10} There is evidence that mental health conditions are significantly higher among first responders than the general population.^{6,7,10-13} There is also evidence of increased burnout and stress injuries are linked to work-related exposure to trauma in professionals working with trauma survivors.^{11,12,14-16} Despite these health disparities, there are limited interventions for preventing and rehabilitating mental health stress injuries among first responders.

With the growing recognition of the impact of trauma exposure on behavior and physical health outcomes, clinicians and researchers must define and measure trauma and describe the characteristics of those exposed. To date, there is no data to demonstrate the mental health status or needs of Colorado's BSAR, and it is unclear which services are available to support Colorado's BSAR teams. This section of the report is aimed to examine and explore the physical and psychological impacts of providing BSAR services and the availability of physical and psychological support for these volunteers.

Methods

Approval of Study

The General Assembly of the State of Colorado sanctioned this study with Senate Bill 21-245. Our study did not undergo an institutional review with the Colorado Multiple Institutional Review Board (COMIRB).

Study Design, Participants, and Setting

We conducted a cross-sectional survey with Colorado BSAR volunteers. Participants identified as volunteer first responders and members of nonprofit BSAR teams were recruited to participate in the survey. We defined BSAR as utilization, training, and support of responders, with their specialized equipment, coordinated by a sheriff to provide service during emergencies or disasters in forests, deserts, mountains, canyons, caves, waters, parks, plains, and at times, in more populated areas. Responders included volunteer teams that work alongside fire, law enforcement, emergency medical personnel, the Colorado National Guard, and other government employees in disasters or emergencies. Eligible participants were identified through purposive sampling and with the assistance of the Colorado Search and Rescue Association (CSAR) and Responder Alliance.

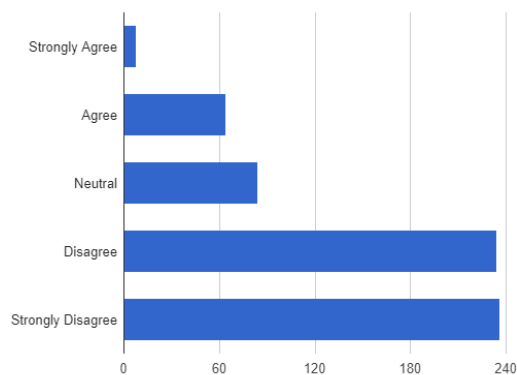
Data Collection and Outcomes

Data were collected and stored using a REDCap database through the University of Colorado Denver Development and Informatics Service Center. Once participants were identified, an

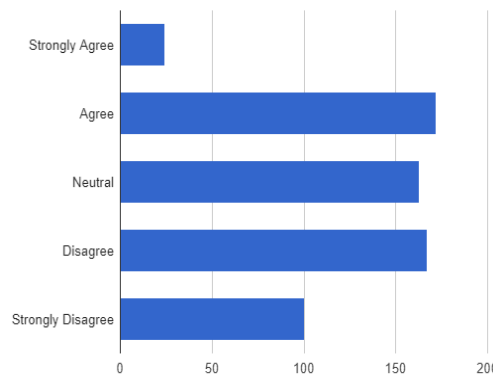
email with the survey was sent to collect information on Tuesday, November 9, 2021, with reminders sent twice over the following 2 weeks. The survey closed on Tuesday, November 30. The survey consisted of 154 questions composed of various validated instruments to assess demographics, experiences, mental health outcomes, including depression, substance use disorder, post-traumatic stress disorder, chronic stress, and burnout. The different questionnaires included the Maslach Burnout Inventory (MBI), Secondary Traumatic Stress Scale, Beck Hopelessness Scale, and self-reported substance use scales.¹⁷⁻²¹ These scales have undergone psychometric testing and are a reliable and valid tool to collect data in similar populations.

Correction for Under-Reporting Bias

From the outset, there was considerable concern among stakeholders that BSAR volunteers would not be fully honest on measures that asked about their mental health concerns. This is in part because of the stigma connected to mental health problems, but also in part because BSAR volunteers who are experiencing problems might no longer be considered “fit for duty” by their peers, and might have to give up their BSAR work. To some extent these same concerns hold true even for admitting to physical health concerns among BSAR volunteers. To get around this challenge, we administered 2 sets of parallel items in the survey: One asked whether the BSAR volunteer had *personally* experienced a problem, and the other asked if they had *seen peer BSAR volunteers affected* by the same problem. The item about peers is not affected by the same under-reporting concerns and is therefore considered a more true number on which to base population-level estimates. The following two graphs illustrate this contrast in participants’ responses:



My BSAR participation negatively impacts how I function in my personal life



I have observed my teammates being negatively impacted by their participation in BSAR

Across the two pairs of items, BSAR volunteers reported on average about 18% more distress on questions about others than on questions about themselves. In the analyses below, we apply this +18% adjustment to people’s reported mental health symptoms in order to obtain a more accurate estimate of BSAR volunteers’ true level of mental health concerns.

Data Analysis

Descriptive analysis of quantitative data was conducted using SPSS version 28 (Armonk, NY: IBM Corporation). For continuous and normally distributed data, means with standard deviations were calculated, and numeric counts with a percent were calculated for categorical variables. The mean values or frequencies for variables were compared between groups using independent Student’s t-test, chi-squared, or Mann-Whitney nonparametric statistics as appropriate. Data are expressed as means \pm SD or the 95% CI for proportions in the text,

tables, and figures. A two-sided p -value < 0.05 was considered evidence of association or difference in sample means or frequencies, and trends were reported when $0.05 \leq p < 0.10$.

Results

Demographic Characteristics

There were 657 survey responses and 47 different BSAR teams represented in the survey. Briefly, the average age of participants was 47 ± 21.47 , 74% of responders identified as male and 26% identified as female, 96.7% identified as non-Hispanic White, and about 86% had some form of higher education completed. Most respondents were active field SAR members (64%), followed by SAR mission leaders/coordinators (18%). The rest of participants were administrative (1.7%), program director/manager/supervisor (2.4%), board member/officer (10%), and other role (3.2%).

Physical and Psychological Impacts of BSAR Work

Physical Health Impacts of BSAR Work. We asked two questions about physical health, both taken from a very well-validated and widely used measure called the SF-36 questionnaire developed by the Medical Outcomes Study group in the 1980s. National data on this measure show that it reliably detects medical problems in a broad range of demographic groups. When someone says that their health is anything less than “very good” (< 4 out of 5), they have an increased chance of death from any cause over the next five years.²² This single item, then, is a good indicator of global health in a population.

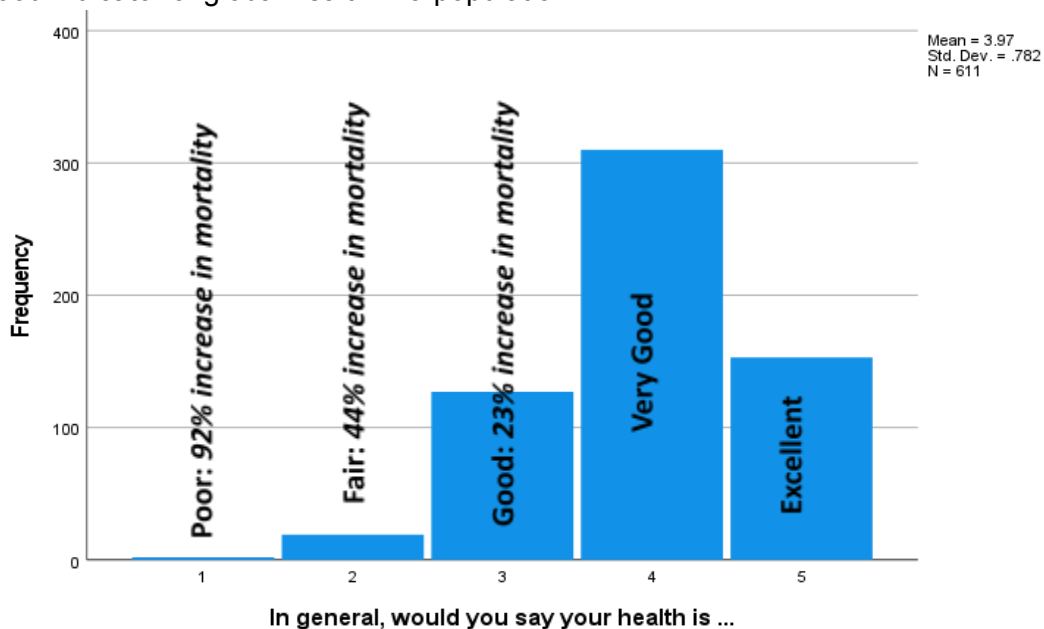
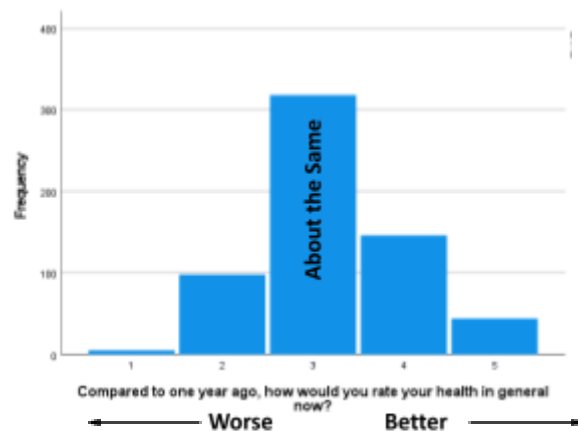


Figure 1. General Self-Reported Health Scale among BSAR volunteers

BSAR volunteers are generally healthy, with 76% reporting either “very good” or “excellent” health. Overall, this is better than the US population, where only 53% say they are this healthy.²² However, 20% of BSAR volunteers were at risk for chronic health problems, and 4% were currently in poor health.

Another way to examine health problems is to look at people’s perceived *changes* in their health status over time. The following graph shows that most BSAR volunteers said their health was “about the same” as last year (a score of 3 out of 5), and some said their health had improved. However, 24% said that their health was either “somewhat worse” or “much worse” now than it had been a year ago. This finding is consistent with the single-item health measure suggesting that as many as 1 in 4 BSAR volunteers is experiencing worsening health, and therefore may be less able to provide BSAR services in the future.



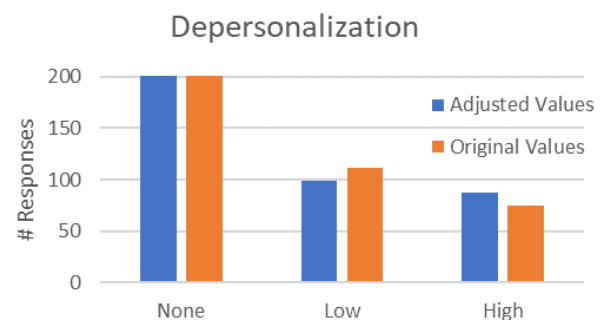
Based on the observed level of risk for health problems, anywhere from 20-25% of the current pool of BSAR volunteers may need to be replaced within the next five years due to medical disability or death. That level of turnover – about 5% a year on average – is only manageable if there is a steady supply of new BSAR volunteers willing to do the work and if other factors such as mental health concerns do not increase the departure of BSAR volunteers from the workforce.

Risk for Burnout. An early warning sign of burnout is feeling less energized or excited about work. This type of experience is captured by the “positive experiences” scale of the Maslach Burnout Inventory, in which lower scores suggest a higher risk for burnout.²³ Based on original numbers, 46.8% of BSAR volunteers reported a low level of positive experiences at work, indicating that they are at risk for burnout. Using the adjusted numbers, more than two-thirds (68.6%) of BSAR volunteers are at risk for burnout based on a lack of positive work experiences.

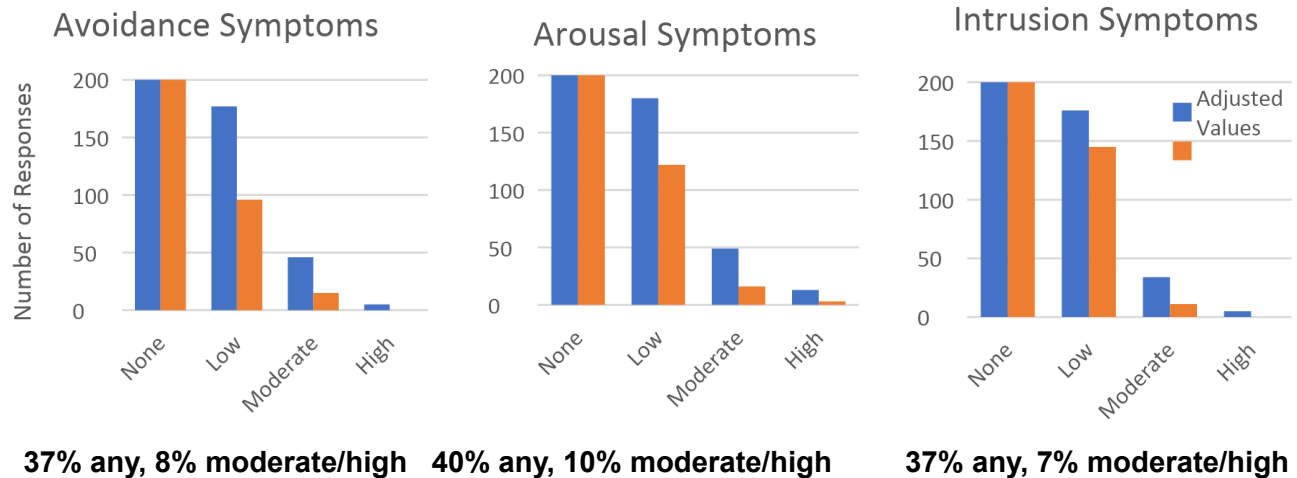


Figure 3. Positive experiences at work for BSAR volunteers

A second burnout scale, depersonalization, suggests a more severe burnout reaction in which people start to see their teammates or the people they rescue as objects rather than as people. This reaction is connected to trauma and often occurs among people moving into more severe burnout. In our sample of BSAR volunteers, 31.3% reported any experiences of this type. The percentage reporting moderate to high levels of depersonalization, which suggests that burnout is actively occurring, was 12.6% based on raw data or 14.7% based on our adjusted estimate.



Traumatic Stress. Our survey also included the Secondary Traumatic Stress Scale (STS), a validated measure of trauma that helping professionals may experience when working with *other people* who have experienced traumatic events.²⁰ This scale also captures the type of reactions that rescue workers may have if they experience traumatic events because direct or indirect exposure to trauma can produce some of the same physiological responses. There are three significant categories of trauma reaction, which involve (a) avoiding situations connected to the trauma, (b) intrusive thoughts or experiences that can include distressing dreams or flashbacks in some cases, and (c) a general state of physical arousal or anxiety in which people find it hard to calm down or relax. One of these symptom clusters, avoidance, has a great deal in common with physical exhaustion and is also a well-accepted sign of burnout; the other two are more uncommon symptoms and are usually signs of traumatic stress.²⁴ Participants' STS survey responses showed that 37% avoid some people or responsibilities related to their BSAR work because of stress. In 8% of these BSAR volunteers, the level of avoidance probably interferes with their work or everyday life. Like the depersonalization scale, this measure again shows that about a third of current BSAR volunteers have some level of burnout and that in about 1 in 10 BSAR volunteers, the level of burnout is likely to have meaningful consequences for the BSAR volunteer's performance, relationships, or health.



BSAR volunteers were slightly more likely to report arousal symptoms, which might be interpreted as excitement instead of anxiety or stress. Based on the adjusted numbers, about 10% of BSAR volunteers are currently experiencing levels of physiological arousal that are likely to interfere with their work, which can predispose them to later health problems like cardiovascular disease. Another 30% of BSAR volunteers have subclinical levels of anxiety or stress that have the potential to become a problem if untreated.

The final STS subscale, intrusion, measures the type of symptoms that most people associate with PTSD, such as flashbacks or disturbing dreams. More than one-third of BSAR volunteers reported some level of intrusive experiences (37% based on our adjusted estimate). In 7% of BSAR volunteers, these symptoms reached a level that would probably qualify them for a mental health diagnosis. Because any level of intrusive symptoms can be distressing, most people who report this type of experience at any level would benefit from some type of mental health treatment.

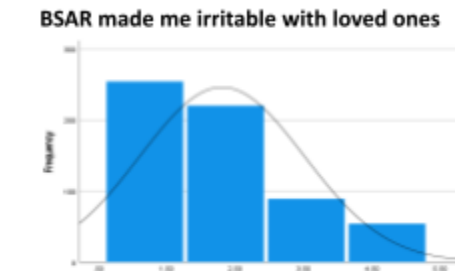
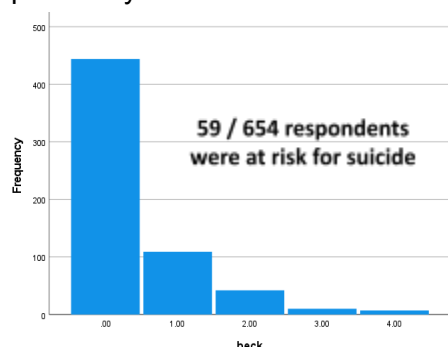


Figure . Irritability among BSAR volunteers

Depression. Our survey included a 2-item depression screening tool, the PHQ-2, but respondents did not generally endorse items related to depression. A cut-off score of 3 out of 6 is recommended for this tool²⁵, and only 4.5% of BSAR respondents had clinically significant depressive symptoms based on that metric even after adjustment for under-reporting. We also asked for an item tied to depression that has less stigma associated with it: *due to the nature of my BSAR work, I am more irritable with loved ones*. On this item, people were more willing to endorse problems, as shown in the graph at right. About a quarter of BSAR volunteers, 23.2% after adjustment for under-reporting, said they agreed with this statement.

Suicide Risk. When we talked to BSAR supervisors and sheriffs, we heard concerns about the possibility of BSAR volunteers becoming suicidal because of the stress related to their work.



We, therefore, included a 4-item version of the Beck Hopelessness Scale (BHS) as a screening tool for suicide risk.²⁶ Suicidal behavior is notoriously hard to predict, but the full version of the BHS has a sensitivity of 80% as a

warning sign for suicide attempts and 78% as a warning sign for other forms of self-harm.²⁷ Items on this scale are less symptom-focused and more philosophical, such as *the future seems dark*; they may therefore be less likely to elicit a defensive reaction than depression scale items like *I feel sad*. Unadjusted results are shown on the left. Based on a cut-off score of 2, 9.6% of BSAR volunteers are at significant risk for suicide, or 11.3% of BSAR volunteers after adjustment for under-reporting. This level of risk is similar to the approximately 1 in 10 BSAR volunteers with severe mental health concerns that we saw on the secondary trauma scale.

Substance Use. Although BSAR volunteers were relatively hesitant to admit to mental health concerns, they were much more willing to disclose current substance use on a brief screening measure.²⁷ Tobacco products were used by 15% of the survey respondents, and drugs, including marijuana (legal in Colorado), were used by 24% of the survey respondents. Only 1% said that they used any prescription medication (e.g., opioids) in a way other than how it was prescribed.

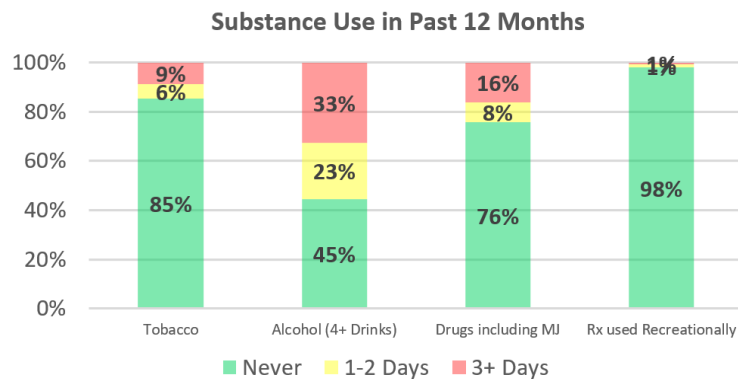


Figure 7. Substance use among BSAR volunteers

The most striking finding was related to alcohol, however, where 23% of respondents endorsed binge drinking (defined as four or more drinks at a single sitting) at least once or twice during the past year, and an *additional* 33% said that they had engaged in binge drinking three or more times. This level of alcohol use suggests that more than half of all BSAR volunteers had potentially problematic drinking, with 33% likely to meet diagnostic criteria for an alcohol use disorder. That level of alcohol use creates risks for mental health problems such as depression and physical health conditions like liver disease, high blood pressure, and diabetes. A high level of alcohol use is also consistent with our general interpretation that BSAR volunteers were under-reporting mental health concerns because people frequently use alcohol as a form of self-medication to reduce their anxiety, depression, or other mental health symptoms.

Risk Factor	This Risk Only	This Risk + Alcohol Use	Total % w/Problems
Medical	11.1%	6.1%	17.2%
Psychological	6.1%	4.8%	10.9%
Neither	49.7%	17.0%	17.0% (alcohol)
Both	2.9%	2.4%	5.3%

Overlap of Physical and Mental Health. The table above shows the overlap between physical and mental health symptoms among BSAR volunteers. In this analysis we considered only the

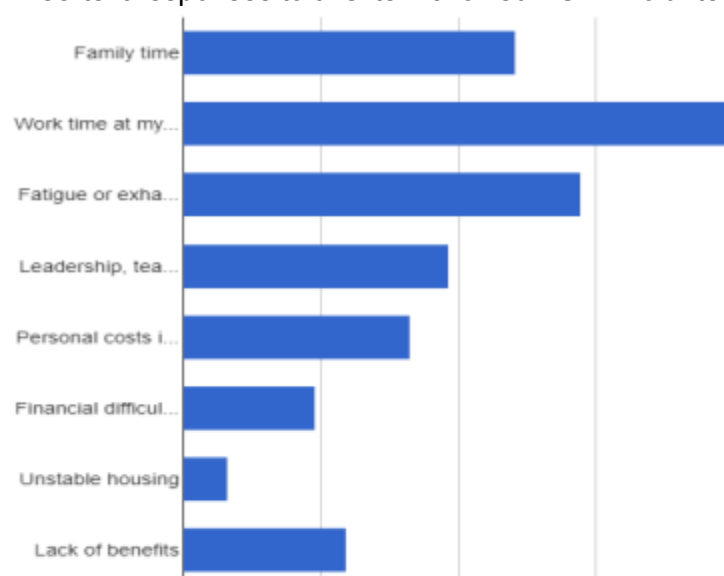
level of physical or mental health problems that would likely interfere with someone’s ability to perform BSAR work – the “current problems” level rather than just “at risk.” The cross-walk of risk factors shows that about 17% of volunteers have current physical health problems that would potentially interfere with their BSAR work, about 11% have psychological problems at a current level of severity that would potentially interfere with BSAR work, about 5% have both types of problems, and about 17% have problematic alcohol use only (defined as 3+ incidents of binge drinking in the past year), which increases their chance for later mental or physical health problems. Only about 50% of BSAR volunteers, then, have no current physical or mental health concerns that might interfere with their performance; the other half of all BSAR volunteers in Colorado may not be at optimal capacity for rescue work due to current, serious physical or mental health concerns.

Intention to Leave BSAR Work. We asked two other items to directly measure people’s intent to leave BSAR work in the next 12 months. One item was simply: *I have thought about leaving this organization.* The other item, *I feel supported by leadership,* was reverse-scored because, in prior studies, a person’s sense of being supported by leaders at their organization is the best single predictor of whether or not they will remain in a particular job. Fully 27.1% of BSAR volunteers said they had thought about leaving, and 19.8% said that they did not feel supported by leadership. Additionally, we asked BSAR volunteers whether they felt prepared to manage the stressors they encountered in their work, and 15.8% of BSAR volunteers said they mostly did not feel prepared. Taken together, these findings suggest that as many as 1 in 5 BSAR volunteers are at risk for leaving their position in the next year without additional support.

Availability and Adequacy of Physical and Psychological Support

Sources of Stress in BSAR Work. As described in other sections of this report, BSAR volunteers said that they had spent a median of \$1,000 of their own money and the equivalent of 50 workdays on BSAR work in the past year. BSAR volunteers also said they had put a median of 700 miles on their personal vehicle in the past year to facilitate their BSAR work. We also asked BSAR volunteers, “*what drained your battery?*” while doing BSAR work in the past year, and some of the responses to this item also mentioned financial stressors. But as shown in the figure below, the single most common response was actually that BSAR volunteers were stressed by their work at a paid job that is not connected to BSAR volunteering. Fatigue or exhaustion was the second-most common response, followed by the amount of time that BSAR work takes away from family time, everyday hassles, and conflicts with leaders or teammates. After that, BSAR volunteers mentioned the personal financial cost of doing BSAR work, and finally they talked about specific stressful situations encountered during BSAR work.

Free-text responses to this item allowed BSAR volunteers to identify additional sources of stress

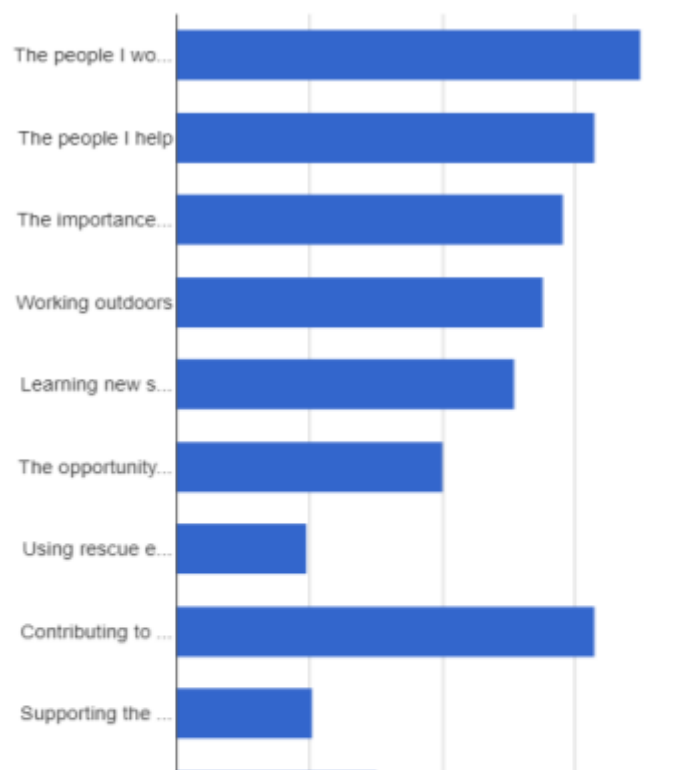


that we didn’t include on our initial list. Of 67 free-text responses, 15 (22%) mentioned COVID as a source of stress in their BSAR work. Another 13 responses (19%) focused on interpersonal conflicts or role difficulties within the BSAR organization, such as a new administrative role, conflict with a team member “who lacks humility and is pretentious,” conflict with other

BSAR jurisdictions or state-level groups like CSAR, the difficulty of training new people “who will never make it,” or a feeling that other team members are not doing their share of the work. Financial stress was the next-most common category with 12 responses (18%), including items like “there are things I need for BSAR that I can’t afford to purchase because we don’t have a gear allowance,” the sentiment that it is difficult to run “an organization that is both an emergency services agency and a nonprofit,” a note that a BSAR volunteer was “living in my truck because of the housing problem here,” and a story about the \$16,000 veterinary costs for a rescue dog injured in the line of duty because “currently these costs are shouldered solely by the SAR volunteer.” A total of 9 responses (13%) mentioned personal health challenges, aging, or injuries; and seven responses (10%) said mental health challenges such as a personal traumatic incident, relationship trouble, and another story about the stress of caring for a rescue dog who was injured in the line of duty. An additional seven responses (10%) described conflict with the community, such as “over-burdening regulations,” lack of support from the sheriff’s office, “SAR not being seen as true first responders,” people who “accuse SAR of not doing enough or moving fast enough to rescue,” and “unprepared people that required rescue.” Finally, three responses (4%) mentioned inadequate training, and the other 2 were personal situations that took time and attention away from BSAR work – i.e., school, home repair projects.

In general, these responses are consistent with the data presented above, showing that only a subset of BSAR volunteers is troubled by specific traumatic stress injuries. However, low-lying dissatisfaction and fatigue can make people more vulnerable to later stress injuries, so the overall picture here is again of a population at risk for mental or physical health problems as new traumatic stressors occur.

Sources of Support for BSAR Work. A second series of checkboxes asked respondents about protective factors that made their BSAR work more meaningful or helped them to manage stress. Teammates were the number 1 response on this item, with “contributing to the community” and “the people that I help” tied for second place. BSAR volunteers also said they were energized by the importance of what they were doing, by the experience of working outdoors, and by chance to learn new skills (and, to a slightly lesser extent, the chance to use specialized rescue equipment). Just being identified with BSAR was also crucial to about a third of our respondents.



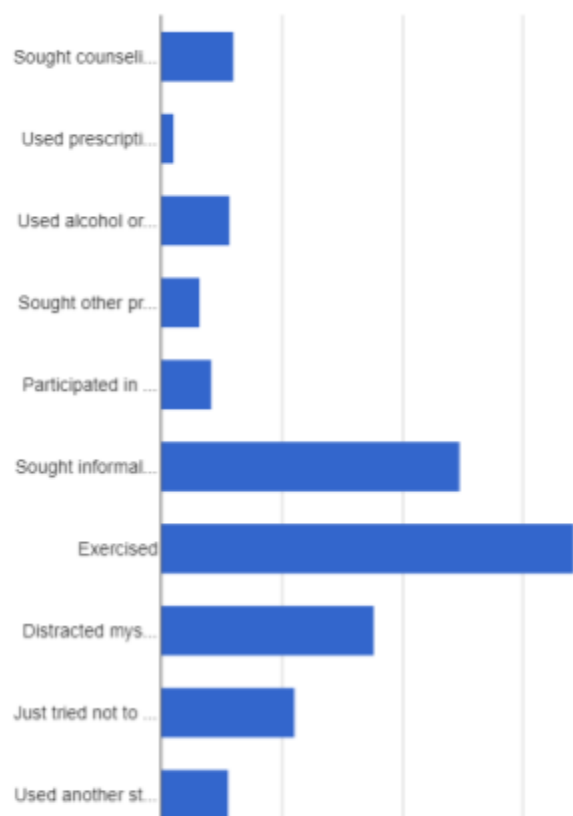
There were also 23 open-ended responses on this item, with the most common category of response involving the chance to work with rescue dogs (6/23 or 26%), e.g., “the bond between me and my K9 partner” or “the dogs teach me so much.” Another six responses (26%) were about finding a sense of purpose in BSAR work, such as having a friend die in a backcountry incident, a personal near-death experience that led the worker to BSAR, the fact that BSAR work is 100% volunteer being highly meaningful, or a sense that “it’s where God has led me; this is where I

am meant to be.” Four responses (17%) involved either attending training events and conferences or else serving as a trainer to others, and 3 (13%) involved leadership roles. Another 3 (13%) were about the excitement of BSAR work, such as “hearing cool search and rescue stories” and “the challenge of participation; the adventure.” One response identified COVID vaccines as a source of support.

Mental Health Concern	% At Risk	% Current Problems
Traumatic Stress	30%	10%
Depression	33%	5%
Suicidality	15%	9%
Alcohol Disorder	23%	33%

Adequacy of Training and Support. The percentage of BSAR volunteers in need of immediate mental health support ranges between 10%-33% based on the different types of problems we asked about in our survey. An additional 15%-30% of BSAR volunteers could benefit from preventive mental health support to prevent current levels of problems from becoming worse or to reduce their risk for future stress injuries. However, only 10.5% of survey respondents said they had previously received any mental health treatment related to their BSAR work. Therefore, the level of unmet need in this population is estimated at 15%-52%, depending on the type of problem and whether the focus of intervention is treatment only or includes prevention. Even at the low end of this range, up to 375 BSAR volunteers in Colorado with an urgent unmet need for support.

Informal Coping Strategies Used. Standard treatment is not the only way to cope with mental health distress, so we also asked BSAR volunteers how they typically cope with stressful



situations in their BSAR work. Perhaps unsurprisingly, the most common single coping strategy endorsed by BSAR volunteers (77%) was *exercise*, which is generally a healthy coping method that reduces stress, improves sleep, and enhances fitness. The second most common coping strategy (56%) was to seek informal sources of support, which is also a healthy coping strategy. The following most common coping strategies were a distraction (40%, e.g., watching TV) or “just tried not to think about it” (26%). These coping avoidance strategies are generally less successful and put people at higher risk of stress injuries later. Only 15% of people said that they had sought counseling, like the 11% who said on a different item that they had received mental health treatment related to their BSAR work. Only 2.5% said they used a prescription medication

to help them cope, but 13% explicitly said that alcohol or non-prescription drugs were part of their usual coping strategy. People also said they sought help from non-mental-health professionals like a minister or coach (7%) or participated in a support group (9%). Open-ended responses on the coping item identified additional strategies like resting or taking time off, talking with a teammate about one's experiences, or participating in a resiliency team offered by the BSAR agency. Several of these responses specifically mentioned the stress injury prevention training by Responder Alliance that we tested as potential support for BSAR volunteers in our pilot program.

Additional Support Requested. We asked BSAR volunteers to answer an open-ended question on what types of support would be most helpful to them in continuing to do BSAR work. Their responses fell into four basic categories:

- Financial support was the #1 category of requests (37% of all responses). These responses included requests to fund childcare, health or life insurance, workers' compensation, housing, gym membership or gym facilities at the BSAR organization, centralized funding or personal stipends to buy gear, compensation that would allow BSAR volunteers to take more time off from their paid jobs, administrative support staff, or physical therapy costs.
- Leadership or training was #2 (25% of all responses) and included items like better communication from leadership, more transparency, a chance to vote on leadership roles, more field training, training for specific types of situations, better communication between leadership and sheriff's offices, better communication with the public, and more flexible training options.
- Team Building was #3 (24% of all responses), including items like opportunities to socialize with teammates outside of a mission, group training activities (especially in-person), opportunities to include family members in BSAR-related events, more recognition from the sheriff's office, and a forum to collaborate with other teams. Several respondents also said that more people are needed in BSAR work overall so that the same people don't have to keep doing everything.
- Mental Health was #4 and accounted for 22% of the open-ended responses. This percentage is interesting because it was higher than the percentage of BSAR volunteers who admitted to having mental health difficulties. Respondents specifically said they wanted more stress management groups, access to free individual therapy, opportunities to talk about BSAR-related stress as a group, and support for discussing their BSAR work with their families. Several people again specifically mentioned the stress injury prevention course from Responder Alliance.

Availability of Mental Health Support from Sheriff's Departments. As described elsewhere, we received responses on another survey tool from 41 out of 62 county sheriff's offices in the state of Colorado (66%). We asked sheriffs if they provide any type of mental health services or mental health education for their local non-profit volunteer SAR team, and only 35% said that they did (60% said no, 5% were not sure). This finding goes along with other indicators that there is a high level of unmet need for mental health support among BSAR teams.

Results of Online Stress Injury Prevention Training. We piloted an online stress injury prevention course and an online support group with BSAR volunteers in fall 2021. At the time of this writing, preliminary results are available for the first group of 29 participants, with more data expected in spring 2022. The initial group was characterized by a small number of BSAR volunteers with current burnout (13%), but a much larger group with risk factors that suggest an increased chance of burnout in the near future (an *additional* 48%). These findings mirror those presented above for BSAR volunteers statewide, and suggest that the pilot participants were a

representative group. Importantly, BSAR volunteers in this pilot group said that they had increased capacity to cope with stress after participating in the program, with improvement on all target learning objectives (all $ps < .001$ in paired pre-post t -tests).

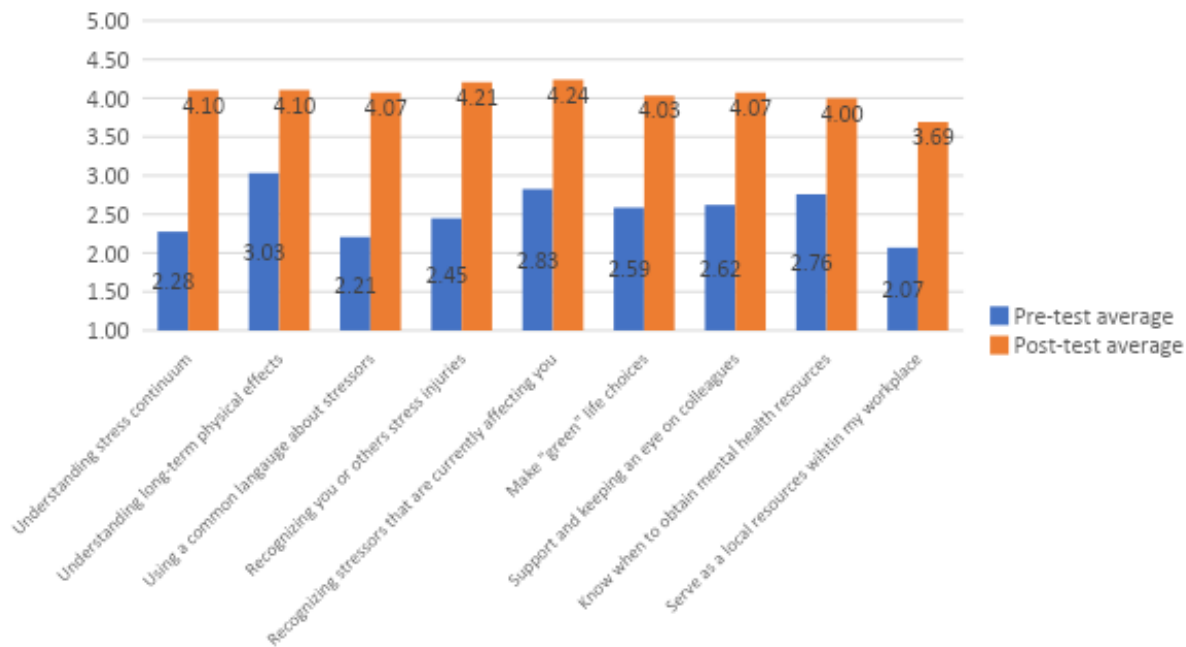


Figure 11. Results of Online Stress Injury Prevention Course

As an overall rating of the course, 86% of participants said that the online stress injury prevention curriculum had been either “very useful” or “extremely useful.” Perhaps most importantly, the percentage of BSAR volunteers who rated their current level of burnout as either high (“orange” level) or very high (“red” level) on a color-coded continuum dropped from 27% to 20% after participation in the brief online course. The effect was strongest for those in the “orange” level of the stress continuum, but was also seen via a slight decrease for those at the “yellow” level of milder stress, which decreased from 31% to 28% and an increase in those at the least-stressed “green” level from 41% to 52%. Importantly, the percentage of BSAR volunteers who already had severe stress injuries (the “red” level) remained constant at 3%. This is a small percentage overall, as it was in the population-level BSAR survey results. But the lack of change for this small group who are already suffering stress injuries suggests that prevention strategies may no longer be effective and that more intensive mental health treatment is likely needed. Both prevention and formal mental health treatment should therefore be part of a comprehensive solution to meet BSAR volunteers’ mental health needs.

Survey of Care Systems and Unmet Need for Services. Using first responder networks, we identified and surveyed providers affiliated with law enforcement or first responders statewide. In Colorado there are a total of 62 mental health professionals that have indicated that they work with first responders, or about 12% of an estimated 500 statewide. Out of the mental health providers identified, 13 (21%) responded to a survey that was sent out to describe the services they offer. Most clinicians were licensed professional counselors (30.8%) and the rest included MD/DO, LCSW, MS/NCC, and licensed psychologists. There was a total of 9 counties represented with the majority based in Arapahoe (15.4%). Police (84%), fire (84%), Search and Rescue (84%), EMS (92%) and healthcare workers (92%) were among the most common first responders they worked with. Clinicians’ most common main areas of focus included PTSD,

depression, anxiety, trauma, stress management, and substance use / addiction. 92% of clinicians offer tele-health, 15% prescribe medications, 46% are involved in critical incident support following major events in their local area. This indicates that in addition to funding mental health support, increasing access to available providers and training existing providers to meet the unique needs of BSAR volunteers seeking mental health support needs to be an area of focus for future mitigation of stress impact.

Discussion and Recommendations

Comparison with Previous Literature

To date, this is one of the most extensive studies exploring mental health outcomes and services among BSAR volunteers in the country and the first study to explore these topics in Colorado. In a cross-sectional survey among 51 rescue workers, 82% reported being in excellent or very good health compared to 76% in our population.³ In various cross-sectional studies of rescue workers and emergency nurses, on average, they reported a prevalence of between 10-30% of traumatic stress compared to 10% in our population; however, up to 30% are at risk among our population.^{11-13,28} In a systematic review by Haugen et al., on average, 9.3% of first responders endorsed barriers to care and need of mental health services⁴, compared to about 10-30% of our population. The data suggest that BSAR volunteers in Colorado may have a greater need than the general BSAR population and have a comparable prevalence of traumatic stress to emergency health workers. The level of burnout among BSAR volunteers is slightly lower compared to healthcare workers averaging ranges between 30-70% compared to around 33% among BSAR volunteers in Colorado.^{14,29-33} However, although only one-third of volunteers have some level of burnout, about 66% are at risk of developing burnout, indicating that they may have comparable levels of burnout to health care workers.

Strengths and Limitations

The main strength of this study is that it involved a large cohort compared to that in similar published studies. Furthermore, we had strong representation across the state and strong external validity. Second, we used validated tools to assess mental and physical health outcomes. The main limitation of our study is that it is cross-sectional, and we were not able to observe any longitudinal changes. Another limitation is that there was much underreporting in our sample; however, we could create a correction factor to help alleviate the impact of stigma among reporting outcomes for mental health issues.

Clinical and Policy Implications

The high prevalence of traumatic stress and burnout among BSAR volunteers is of clinical importance as a significant proportion of volunteers may be experiencing adverse effects of trauma, and these symptoms may contribute to emotional exhaustion and increased volunteer turnover.^{14,16,18} We found that at least 1/5 of the BSAR volunteer workforce will need to be replaced in the next five years, given the elevated risks of adverse physical and psychological outcomes. Our findings likely underestimate actual numbers given the existing stigma associated with seeking mental health service or admitting to mental health issues. The literature shows that 33.1% of first responders endorse stigma regarding mental health care due to fears with confidentiality and negative career impact, which can potentially lead to underreporting and delayed presentation to care, therefore increasing the risk of chronicity of mental health conditions.⁴

The overlap between burnout and STS with depression and PTSD has been well documented among health care professionals where burnout affects nearly between 10-70% of nurses and

30-50% of physicians, with higher prevalence rates among emergency and critical clinical settings.^{6,29,30} A cross-sectional study of Austrian physicians found that 10.3% were affected by major depression and about 50.7% were affected by burnout. The OR of experiencing burnout in physicians without depression was 2.99 (95% CI 2.21-4.06) compared to 10.14 (95% CI 7.58-13.59), 46.84 (95% CI 35.25-62.24), and 92.78 (95% CI 62-136) of physicians experiencing mild, moderate, and severe signs of depression respectively.³² Our findings do not support the overlap between burnout and STS with depression as 5% are experiencing depression, yet about a third are experiencing burnout and STS. The use of depression inventories in addition to burnout inventories may not be useful to identify people experiencing mental health consequences, however, may be a tool used to identify people to prevent the development of depression.

Given that first responders are at greater risk of experiencing stress they are likely to engage in substance use as a form of coping and therefore have an increased risk of developing substance use disorder. In our survey, we saw that nearly half of the population is at risk for problematic drinking and about 33% meet diagnostic criteria for alcohol use disorder. Similarly, in national surveys it has been found that about 29% of firefighters are at risk of alcohol use disorder, 25% of the police force report hazardous alcohol consumption, and around 30% of emergency responders are at risk of any substance use disorder.³⁴⁻³⁸ Our numbers suggest that substance use is similar to other first responder populations though slightly higher, likely given the barriers to access to care for mental health services among our population. The stress and trauma that BSAR volunteers experience daily likely drives professionals towards substance use to cope with the severe psychological harms they encounter.

Recommendations

The following strategies are recommended to meet BSAR volunteers' identified mental and physical health needs. Additionally, paid staff (sheriffs and their deputies, state agency employees, and other first responders) that are often involved in BSAR would benefit from some of these additional mental and physical health support services. Therefore, we will use the term "BSAR professionals" below to refer to both unpaid BSAR volunteers and paid staff:

- Offer training and screening tools to identify health problems early in BSAR professionals with a clear pathway for ongoing screening, evaluation and BSAR focused care. These interventions might be acceptable to BSAR professionals if presented as a benefit of their work, or a way to maintain fitness for duty
- Provide financial support, such as health care coverage, to those BSAR volunteers who are experiencing a physical health problem. Paid medical care should also be extended to BSAR volunteers' animals such as rescue dogs
- Create networks for social support, and additional opportunities for social interaction with peer BSAR professionals. These could be both within and across BSAR agencies. Interagency training has been utilized historically to this end.
- Fund and deliver training programs to identify and eliminate burnout through mental health support, improved communication skills, optimized teamwork, and evidence-based interventions. Recommend annual training budget allotment of \$250K annually to support statewide Stress Injury Awareness (SIA) training, with subsequent peer support training and annual oversight, summits and supportive gear. Training also could include online programs to bolster resilience and prevent traumatic stress, such as the one piloted in fall 2021 with selected BSAR teams. As an example, the cost of the training per rescuer is \$160. The goal would be to train one-third (an estimated 933 volunteers) of the BSAR population annually, at a cost of \$150K annually for the 8-hour stress awareness course. This estimate does not include support for paid agency staff

often involved in BSAR. Ongoing costs, once training offered to all existing BSAR volunteers would include leadership training, peer support training and ongoing refresher training

- Offer team-level interventions designed to address the cumulative burden of critical incidents, with a particular emphasis on improving team-level communication and increasing confidence in team leadership. Separate leadership training might also be appropriate to help team leaders meet their volunteers' needs more effectively or to help BSAR volunteers more effectively communicate about and advocate for their work with the public. Estimated cost of annual training is included above in the discussion of BSAR training (\$250K annually).
- Coordinate clinical services from community mental health providers who could be contracted and trained to address the unique mental health needs of BSAR professionals by a "centralized coordinating center", such as the successful hub-and-spoke program in SB 19-001 at the University of Colorado. These BSAR providers should offer a range of formal mental health services that include psychological debriefing, talk therapy (e.g., cognitive-behavioral interventions), and pharmacotherapy. These should be available confidentially and at no cost to BSAR professionals. Estimated annual costs of initiating and maintaining a hub-and-spoke model of statewide support.

It is recommended that this offering exists outside of the traditional workman's compensation model, given the ongoing complexity of fitness for duty, ill-defined pathways for identification and support of occupationally derived psychological injury, and the stigma associated with BSAR volunteers' use of this occupational pathway for mental health support. The formal structure for a fund, foundation, trust, or funded central organization should be identified in the strategic planning phase, using existing and novel examples that have been successful for BSAR volunteers.

Recommend consideration of the hub and spoke model used by University of Colorado for opioid mitigation statewide (SB-19-001), which operates at a starting annual cost of \$400K. This amount accounts for both support of a coordinating center and a pass-through fund to provide resources for utilization of central prescribing and telehealth, and decentralized local support of both therapy, screening, critical incident support and follow-up. This number should grow annually. If one-third of estimated BSAR volunteers participated in 6 sessions of mental health therapy, the cost would be approximately \$560K.

The greater the success of the awareness and stigma-reducing education, the more likely the use of the BSAR focused services, increasing the need for funding over the coming years.

Acknowledgments

This study was supported by the Colorado state legislature under S.B. 21-145.

Disclosures

The authors have no conflicts of interest or disclosures.

Appendix 1

Table 1. Secondary Traumatization Scale Results

Survey Question	Never	Rarely	Occasionally	Often	Very often
My heart started pounding when I thought about my BSAR work	53.6	28.1	16.2	1.5	0.5
It seemed as if I was reliving the trauma(s) experienced by the people I rescued	69.5	19.8	7.6	2.6	0.5
Reminders of my BSAR work upset me	66.8	25.4	7.5	0.3	0
I thought about my BSAR work when I didn't intend to	43.2	31.1	18	6.2	1.5
I had disturbing dreams about my BSAR work	75.2	19.7	4.5	0.7	0
I feel emotionally numb	49.5	28.9	16.8	4.1	0.7
I felt discouraged about the future	56.3	25.6	13.6	3.6	0.8
I had little interest in being around others	58.9	24.7	11.6	3.6	1.1
I was less active than usual	58.7	23.4	13.5	3.9	0.5
I avoided people, places, or things that reminded me of my BSAR work	76.5	16.8	4.6	2	0.2
I wanted to avoid some type of people in my BSAR work	59.1	24.6	11.3	4.3	0.7
I noticed gaps in my memory about BSAR work	78.7	14.8	5.4	0.8	0.2
I had trouble sleeping	47.5	31.1	16.9	3.6	0.8
I felt jumpy	72.4	19.2	6.6	1.6	0.2
I had trouble concentrating	53.9	29.1	14.3	2	0.7
I was easily annoyed	50.9	27.3	17.2	3.6	1
I expected something bad to happen	61.1	25	11.2	2.1	0.5

Table 2. Maslach Burnout Inventory Results

Survey Question	Never (%)	At least a few times a year (%)	At least once a month (%)	Several times a month (%)	At least once a week (%)	Several times a week (%)	Every day
I can easily understand the actions of my teammates and leadership	0	4.8	5.8	14.5	14.5	29.2	31.1
I deal with other people's problems successfully	2.9	14.3	12.6	17	14.8	24.8	13.8
I feel that I influence other people positively through my BSAR work	0.8	9.3	9.6	19.2	17.5	22.2	21.4
I feel full of energy when doing BSAR work	1.7	7.4	9	19	16.9	18.1	27.9
I find it easy to relax in my BSAR work	3.9	9.4	13	18.6	14.3	18.9	21.8
I feel stimulated when I have been working closely with my BSAR teammates	0.8	5.6	8.8	15.3	14.2	22.7	32.5
I have achieved many rewarding objectives in my BSAR work	0.7	10.7	10.7	14.9	15.1	19.8	28.3
In my BSAR work I am very relaxed when dealing with people's emotional problems	5.6	20.9	14.1	17.3	13.8	14.1	14.1
I get the feeling that I treat some people impersonally in my BSAR work as if they were objects	58.7	27.2	7.3	3.2	2	1	0.7
I have become more callous to the people I rescue since I started doing BSAR work	53.5	25.9	5.6	5.7	3.9	2	3.4
I'm afraid that my BSAR work makes me emotionally harder	50.2	28.9	7.3	5.9	3.9	1.5	2.4
I'm not really interested in what is going on with many of my BSAR teammates	54.3	25	7.5	5.8	3.6	2.1	1.7
I have the feeling that my BSAR teammates blame me for some of their problems	73.8	17.1	4.1	2.5	1	0.8	0.7

Table 3. Summary of Chronic Stress Impact Among BSAR Volunteers

Survey Question	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
My BSAR participation negatively impacts how I function in my personal life	1.3	10.2	13.4	37.4	37.7
Due to the nature of my BSAR participation, I am more irritable with my loved ones	1.6	8.6	14.2	35.1	40.5
I have observed my teammates being negatively impacted by their participation in BSAR	3.8	27.5	26	26.7	16
I have thought about leaving this organization	5.8	21.3	15.2	24.4	33.2
I feel supported by leadership	35.1	45.1	13.6	3.2	3

References

1. Palgi Y, Ben-Ezra M, Essar N, Sofer H, Haber Y. Acute stress symptoms, dissociation, and depression among rescue personnel 24 hours after the Bet-Yehoshua train crash in Israel: the effect of gender. *Prehosp Disaster Med.* 2009;24(5):433-437.
2. Soffer Y, Wolf JJ, Ben-Ezra M. Correlations between psychosocial factors and psychological trauma symptoms among rescue personnel. *Prehosp Disaster Med.* 2011;26(3):166-169.
3. van der Velden PG, van Loon P, Benight CC, Eckhardt T. Mental health problems among search and rescue workers deployed in the Haiti earthquake 2010: a pre-post comparison. *Psychiatry Res.* 2012;198(1):100-105.
4. Haugen PT, McCrillis AM, Smid GE, Nijdam MJ. Mental health stigma and barriers to mental health care for first responders: A systematic review and meta-analysis. *J Psychiatr Res.* 2017;94:218-229.
5. Antony J, Brar R, Khan PA, et al. Interventions for the prevention and management of occupational stress injury in first responders: a rapid overview of reviews. *Syst Rev.* 2020;9(1):121.
6. Firew T, Sano ED, Lee JW, et al. Protecting the front line: a cross-sectional survey analysis of the occupational factors contributing to healthcare workers' infection and psychological distress during the COVID-19 pandemic in the USA. *BMJ Open.* 2020;10(10):e042752.
7. Ward C, Lombard C, Gwebushe N. Critical incident exposure in South African emergency services personnel: prevalence and associated mental health issues. *Emergency Medicine Journal.* 2006;23(3):226-231.
8. Forman-Hoffman VL, Bose J, Batts KR, et al. Correlates of lifetime exposure to one or more potentially traumatic events and subsequent posttraumatic stress among adults in the United States: results from the mental health surveillance study, 2008-2012. *CBHSQ data review.* 2016.
9. Kshtriya S, Kobezak HM, Popok P, Lawrence J, Lowe SR. Social support as a mediator of occupational stressors and mental health outcomes in first responders. *J Community Psychol.* 2020;48(7):2252-2263.
10. Berger W, Coutinho ES, Figueira I, et al. Rescuers at risk: a systematic review and meta-regression analysis of the worldwide current prevalence and correlates of PTSD in rescue workers. *Soc Psychiatry Psychiatr Epidemiol.* 2012;47(6):1001-1011.
11. Shah SA, Garland E, Katz C. Secondary traumatic stress: Prevalence in humanitarian aid workers in India. *Traumatology.* 2007;13(1):59-70.
12. Ratrouf HF, Hamdan-Mansour AM. Secondary traumatic stress among emergency nurses: Prevalence, predictors, and consequences. *Int J Nurs Pract.* 2020;26(1):e12767.
13. Dominguez-Gomez E, Rutledge DN. Prevalence of secondary traumatic stress among emergency nurses. *J Emerg Nurs.* 2009;35(3):199-204; quiz 273-194.
14. Orrù G, Marzetti F, Conversano C, et al. Secondary traumatic stress and burnout in healthcare workers during COVID-19 outbreak. *International journal of environmental research and public health.* 2021;18(1):337.
15. Argentero P, Setti I. Engagement and Vicarious Traumatization in rescue workers. *Int Arch Occup Environ Health.* 2011;84(1):67-75.
16. Greinacher A, Derezza-Greeven C, Herzog W, Nikendei C. Secondary traumatization in first responders: a systematic review. *Eur J Psychotraumatol.* 2019;10(1):1562840.
17. Everly GS, Smith KJ, Lobo R. Resilient leadership and the organizational culture of resilience: construct validation. *International Journal of Emergency Mental Health and Human Resilience.* 2013;15(2):123-128.

18. Jenkins SR, Baird S. Secondary traumatic stress and vicarious trauma: a validation study. *J Trauma Stress*. 2002;15(5):423-432.
19. Naude J, Rothmann S. The validation of the Maslach Burnout Inventory-Human Services Survey for emergency medical technicians in Gauteng. *SA Journal of Industrial Psychology*. 2004;30(3):21-28.
20. Bride BE, Robinson MM, Yegidis B, Figley CR. Development and validation of the secondary traumatic stress scale. *Research on social work practice*. 2004;14(1):27-35.
21. Steed L. Further validity and reliability evidence for Beck Hopelessness Scale scores in a nonclinical sample. *Educational and Psychological Measurement*. 2001;61(2):303-316.
22. DeSalvo KB, Bloser N, Reynolds K, He J, Muntner P. Mortality prediction with a single general self-rated health question. A meta-analysis. *Journal of general internal medicine*. 2006;21(3):267-275.
23. Bakker AB, Demerouti E, Schaufeli WB. Validation of the Maslach Burnout Inventory - General Survey: An Internet Study. *Anxiety, Stress, & Coping*. 2002;15(3):245-260.
24. Jacobs I, Charmillot M, Martin Soelch C, Horsch A. Validity, reliability, and factor structure of the Secondary Traumatic Stress Scale-French version. *Frontiers in psychiatry*. 2019;10:191.
25. Löwe B, Kroenke K, Gräfe K. Detecting and monitoring depression with a two-item questionnaire (PHQ-2). *Journal of Psychosomatic Research*. 2005;58(2):163-171.
26. Aish A-M, Wasserman D. Does Beck's Hopelessness Scale really measure several components? *Psychological Medicine*. 2001;31(2):367-372.
27. McMillan D, Gilbody S, Beresford E, Neilly L. Can we predict suicide and non-fatal self-harm with the Beck Hopelessness Scale? A meta-analysis. *Psychol Med*. 2007;37(6):769-778.
28. Mealer M, Jones J. Posttraumatic stress disorder in the nursing population: a concept analysis. Paper presented at: Nursing forum2013.
29. Bridgeman PJ, Bridgeman MB, Barone J. Burnout syndrome among healthcare professionals. *The Bulletin of the American Society of Hospital Pharmacists*. 2018;75(3):147-152.
30. Cieslak R, Shoji K, Douglas A, Melville E, Luszczynska A, Benight CC. A meta-analysis of the relationship between job burnout and secondary traumatic stress among workers with indirect exposure to trauma. *Psychol Serv*. 2014;11(1):75-86.
31. Ford EW. Stress, burnout, and moral injury: the state of the healthcare workforce. In. Vol 64: LWW; 2019:125-127.
32. Wurm W, Vogel K, Holl A, et al. Depression-Burnout Overlap in Physicians. *PLoS One*. 2016;11(3):e0149913.
33. Zborowska A, Gurowiec PJ, Młynarska A, Uchmanowicz I. Factors Affecting Occupational Burnout Among Nurses Including Job Satisfaction, Life Satisfaction, and Life Orientation: A Cross-Sectional Study. *Psychol Res Behav Manag*. 2021;14:1761-1777.
34. Donnelly E, Siebert D. Occupational risk factors in the emergency medical services. *Prehospital and disaster medicine*. 2009;24(5):422-429.
35. Oehme K, Donnelly EA, Martin A. Alcohol abuse, PTSD, and officer-committed domestic violence. *Policing: A Journal of Policy and Practice*. 2012;6(4):418-430.
36. Violanti JM. Alcohol abuse in policing. *FBI L Enforcement Bull*. 1999;68:16.
37. Jahnke SA, Poston WC, Haddock CK. Perceptions of alcohol use among US firefighters. *Journal of Substance Abuse and Alcoholism*. 2014;2(2):1012.
38. Abuse S. First responders: Behavioral health concerns, emergency response, and trauma. 2018.

APPENDIX F

Credentialing is an important topic when considering improvements to BSAR training, so it will be covered in acute detail in this Appendix.

- **Credentialing** is the evaluation process of granting formal recognition to (or tracking the status) of individuals, programs, organizations, processes, products, etc. that meet a predetermined and standardized criteria. Certificates, certification, accreditation, licensure, and registration are part of credentialing.
 - *Certificate* is recognition of completion of a knowledge or skill activity; it is not a demonstration of competence.
 - *Certification* is a process by which an entity recognizes individuals who have demonstrated a specific level of knowledge, skill, and ability. Certification is offered by non-governmental, typically third-party organizations.
 - *Accreditation* is a process by which an entity recognizes an organization that offers a service according to defined standards. Accreditation is granted by non-governmental organizations.
 - *Licensure* is similar to certification but is a mandatory requirement overseen by a governmental agency.
 - *Registration (or registry)* is a process by which the individual agrees to comply with rules and regulations, code of ethics, meet continuing education requirements, etc. Registration is offered by non-governmental organizations.
- Colorado does not have a statewide BSAR credentialing system, but some other states do (e.g., CA, OR, WA)
 - For example, Washington BSAR volunteers along with SAR deputies have identified and defined SAR core competencies, which can be referenced here: <https://wasarvac.org/core-competency-program/>
- **National programs**
 - **The National Association of Search and Rescue (NASAR)** has a SAR Academy that offers a variety of online, on-site, and blended SAR courses and certifications for individuals. The online programs are relatively inexpensive, but on-site courses and evaluations can be expensive, especially when travel and accommodations are required. The NASAR certifications use American Society for Testing and Materials (ASTM) standards. For example, NASAR SARTECH II certification is based on 17 ASTM standards and 1 National Wildfire Coordinating Group (NWCG) standard. Adoption of the ASTM standards likely lead to the SARTECH II certification being accepted by agencies like the U.S. Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), U.S. Department of the Interior (DOI), National Park Service (NPS), and California Governor's Office of Emergency Services (Cal OES). While voluntary, some Colorado BSAR teams participate in NASAR training and evaluation programs, but how many and to what degree is largely unknown. With that said, NASAR's programs offer a credible pathway to develop unskilled and inexperienced volunteers that can be beneficial for some teams.
 - **FEMA** provides a vast array of disaster and emergency response training of which a few are BSAR related. FEMA also has established categories (known as *typing*) to set baseline criteria that represent the minimum requirement for SAR personnel to participate in the National Incident Management System (NIMS) Integration Center's National Emergency Responder Credentialing System. In regards to the typing of wilderness and mountain rescue teams and rescuers, it

seems that FEMA's efforts have been stalled for many years (First draft published in 2004 and the most recent version in 2017). There is still no FEMA accreditation. The defined standard is only a list of attributes. Colorado's top BSAR teams meet and generally exceed the FEMA/NIMS requirements for the top-level mountain rescue team category.

- **The National Mountain Rescue Association (MRA)** Rocky Mountain Region accredits teams every five years in a rigorous peer-evaluation process. Currently, 15 Colorado teams are accredited.
- **State programs**
 - CSAR offers two search management courses – basic and advanced – for team incident commanders. These are basically a Colorado tailored-version of NASAR's search management course. However, CSAR is able to deliver the training at a much lower cost than NASAR and does not require that individuals re-take (and pay for) these classes every two years. When more resources are available, CSAR has plans to increase the number and diversity of classes it teaches. In 2022, it plans to start offering training using collaborative online mapping software.
 - For over 40 years, Summit County Rescue Group (SCRG) has organized an annual Avalanche Rescue Seminar aimed at Colorado BSAR teams. The program is very affordable and is well attended.
- **Online curriculum**
 - There are some online subscriptions that allow access to a database of learning and teaching material, designed for mountain rescuers. One such resource is www.mountainsafety.info, which any MRA member has access to.
- **Conferences and conventions**
 - **The Colorado Search and Rescue Conference (SARCon)** has been hosted by CSAR for decades. In 2016 it became a joint effort between Flight For Life Colorado and CSAR to provide presentations and hands-on practicums with a mixture of medical and BSAR topics. The training at SARCon are designed to be lost-cost approaches for BSAR volunteers. The Breckenridge campus of Colorado Mountain College is used to keep down costs. However, this limits SARCon to 125 participants, though in 2020 the conference was virtual and 160 participated. Topics are diverse and BSAR specific, and include such subjects as airway management, bleeding control, medical decision-making, cell phone forensics, mapping, technical evacuations, avalanche rescue, etc. CSAR offers numerous scholarships to SARCon, which bolsters participation and is a tangible benefit for the individuals whose teams are members of CSAR. Media coverage on the 2021 SARCon can be found below:
<https://www.summitdaily.com/news/crime/colorado-search-and-rescue-teams-gather-in-summit-county-for-annual-training/>
 - Problems with past Colorado efforts for statewide BSAR conferences/workshops have been both burnout for volunteers putting it on, as well as low attendance due to concerns of being called up for BSAR incidents while at the conference.
 - Other states, such as Washington, Oregon, and Alaska, have a statewide SAR convention, but these programs are organized (or co-organized by a state agency already responsible for SAR).
- **Technical programs**
 - First Aid and Emergency Care

- **Emergency Medical Technician (EMT)** - A urban-based out-of-hospital license taught by many organizations using a national standardized curriculum followed by national testing and registration. To practice in Colorado, EMTs must be certified and hold a national registration to be licensed by the Colorado Department of Public Health & Environment. Some provider programs offer an additional module for wilderness care; however, there are no standards or governmental-recognized certification of a wilderness EMT. EMT courses are taught by private entities and at many colleges. The EMT curriculum at the Front Range Community College in Boulder requires 12 credit hours (typically 120 to 150 hours) of classes and costs over \$2000.
- **Emergency Medical Responder (EMR)** – Formally known as “first responder” these certified providers for out-of-hospital emergency care have a smaller scope of practice than EMTs. Though not wilderness oriented, some teams have adopted EMR as it aligns well when their medical direction is directed from a hospital-based system. A 3 credit hour EMR course taught by Front Range Community College in Boulder costs roughly \$500.
- **Wilderness First Responder and Wilderness First Aid** - These programs are aimed at outdoor professionals (guides, trip leaders, and BSAR), but are expensive and expensive to maintain currency. These programs have no national or state licensure requirements. A 9 day Wilderness First Responder Course taught in Boulder by the National Outdoor Leadership School costs \$850. Recertifying every 3 years requires a 2-day course and course costs start at about \$300.
- **CPR, First-aid** – Basic level care, often provided by the *American Red Cross*. These classes take approximately 8 hours and cost \$35 online and \$90 if in person.
- **Outdoor Emergency Care (OEC)** – Offered by the *National Ski Patrol* is similar to an EMT but emphasizes care for patients in the wilderness, with special emphasis on snowsports pathology. Training is similar to an EMT, but there is no state (or federal) certification or licensure for OEC providers. The National Ski Patrol does require strict and robust yearly recertification. A 4 credit class taught by Colorado Mountain College costs roughly \$360.
- Winter Recreation and Avalanches
 - There is basically no certification in the US for avalanche training (levels 1 and 2), there are only certificates of completion.
 - There are many providers of avalanche awareness training in Colorado; however, nearly all training is aimed at recreational backcountry skiers/snowboards and snowmobilers. While much of the information also applies to BSAR members, there are very few educators in Colorado that can put the information into the context of BSAR.
 - In recent years Colorado Mountain College – Leadville, American Avalanche Institute, and Silverton Avalanche School have started to offer Avalanche SAR (AvSAR) training aimed at BSAR and ski patrols. A national curriculum standard is in the process of being prepared by the American Avalanche Association but it has not yet been adopted.
- Technical Rope Rescue

- Technical rescue with ropes may appear to be similar to recreational rock climbing (both disciplines use much of the same gear), however it is actually very different. BSAR rescues involve heavier loads and much greater forces, so rigging and techniques employed can be unique.
- Technical rope systems as used in industry and by the fire service often are not practical for BSAR teams where distance, elevation, weight, weather, and very irregular terrain require different analysis and techniques.
- There are several providers of technical rope rescue training in Colorado; industry leaders include *Colorado Mountain College – Breckenridge*, *Rescue 3*, *Rigging For Rescue*, and *Elevated Safety*.