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Determining Technical Rescue Service Levels in Hood River, Oregon

Devon J. Wells

Hood River Fire Department

Hood River, Oregon

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

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Abstract

The problem was that the Hood River Fire Department (HRFD) did not know what level of technical rescue services it should provide to the people that live, work, and recreate in the community. The purpose of this research was to investigate what level of technical rescue services should be provided by the HRFD. Descriptive research was used, with interviews and targeted questionnaires, along with a literature review, to answer the following questions: (a) What activities occur in Hood River that might require technical rescue services, (b) what technical rescue services do people in the community expect the HRFD to provide, and (c) what resources are needed to provide technical rescue services in Hood River?

The results of the research indicated that the community of Hood River has many activities that might require technical rescue services. The results also identified that the HRFD is expected to provide technical rescue services to the community. Survey results and literature reviews confirmed that the general public believes the fire department provides a certain level of service for all emergencies. Specifically, confined space, trench, and surface water rescue were identified in the research as a high priority. Finally, the literature review revealed that technical rescue teams require a large amount of resources, both in personnel and equipment.

Recommendations were made to the Hood River Fire Department to implement programs in surface water, confined space, and trench rescue, as well as awareness training in all competencies. It was also recommended to purchase the minimal equipment needed for awareness level response and to develop a complete equipment list for budget preparation. Finally, it was recommended that the HRFD seek community partnerships to lessen the financial impact of starting a technical rescue team.

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Introduction

When emergencies occur, first responders are summoned to the scene to provide assistance, reassurance, and solutions. These responders are expected to perform and provide services that help remedy the situation. Citizens expect that fire departments will respond to emergencies and rescue victims, regardless of the situation (Collins, 2006). Some of the services are technical in nature and require specific training, equipment, and guidelines. However, many citizens believe that their department can fix any problem, while maintaining professionalism and strict response standards (Collins, 2006).

Fire departments across the world have varying levels of technical rescue programs. However, the problem is that the Hood River Fire Department (HRFD) does not know what level of technical rescue services it should provide to the people that live, work, and recreate in Hood River, OR. The purpose of this research is to investigate what level of technical rescue services should be provided by the HRFD.

This paper will report the results of descriptive research, using interviews and targeted questionnaires, along with a literature review, to answer the following questions: (a) What activities occur in Hood River that might require technical rescue services, (b) what technical rescue services do people in the community expect the HRFD to provide, and (c) what resources are needed to provide technical rescue services in Hood River?

Background and Significance

The City of Hood River is located on the northern border of Oregon with Washington, along the Columbia River and at the base of a valley capped by Mt. Hood. It is a City founded on supporting the agricultural and timber industries in the early 1900's. It has become a bedroom community of Portland and an outdoor enthusiast's vacation destination. Hood River is home to multiple outdoor adventure sports, including, but not limited to windsurfing, kite boarding, stand up paddle boarding, mountain biking, and kayaking. The City is approximately three square miles with a permanent resident population of 7,167 (Cubit, 2011).

In 1904, following numerous devastating fires in local businesses, residents in the City of Hood River decided they needed organized fire protection. They formed the first organized fire department in the County as an all-volunteer department. It survived on tax dollars and donated funds alone, along with generous residents. The City had many store owners and employees volunteering their time to protect the community. This department organization lasted until Hood River began providing dispatch and ambulance services in the 1970's. Also, the change in industry focus from agriculture to tourism began in the 1980's. The wind that blew through the Columbia River Gorge became world famous for windsurfers, increasing the demand on the fire service.

By the mid-1990's, there were eight full time firefighters in the City of Hood River. Today, 15 full time Firefighter/Paramedics, in addition to a full time Fire Chief and Fire Marshal, operate the department with a complement of 25 volunteers. The department has started a Fire Corps program to utilize volunteers in areas other than emergency response.

The Hood River Fire Department is the only 24-hour per day staffed agency and provides fire protection services in the City limits and Advanced Life Support (ALS) ambulance services to the majority of the County. The demands being placed on the administration and the firefighters continue to increase and are a topic of conversation commonly heard in the fire station. However, budget conscious decisions have to be made and services provided at a level that is affordable and safe.

Special operations and technical rescue have never been a formal part of the Hood River Fire Department. However, the HRFD has an obligation to help its citizens and the many visitors taking advantage of the powerful winds and scenic waterways. Also, industry has increased in the past ten years, with many small- to medium-sized breweries and distilleries locating in the area. Construction is on the rise and old City-owned infrastructure (water lines, storm drains, etc.) is being replaced in multiple urban renewal projects (Raefield-Gobbo, 2011).

The problem of not having a defined service level for technical rescue creates liability to the City of Hood River. National standards explain what is expected of a fire department and create a legal obligation to provide appropriate equipment and training to their members (Pendley, 2006). For this reason, the Hood River Fire Department will benefit from a study looking into what level of technical rescue services they should provide. This applied research project will examine and identify the public's expectations for technical rescue service provision, options for providing technical rescue, and the resources required for technical rescue.

This directly relates to the goal of the National Fire Academy's Executive Analysis of Fire Service Operations in Emergency Management (EAFSOEM) course, "to prepare senior fire officers in the administrative functions necessary to manage the operational component of a fire

department effectively" (United States Department of Homeland Security, 2010, p. SM 1-6). Also, by investigating technical rescue services in Hood River, OR, this research relates to two goals of the U.S. Fire Administration. Goal Two states "improve local planning and preparedness" and Goal Three states "improve the fire and emergency services' capability for response to and recovery from all hazards" (United States Fire Administration [USFA], 2010, p. 14).

Literature Review

According to the National Fire Protection Association's (NFPA) standard 1670, technical rescue is defined as "the application of special knowledge, skills, and equipment to safely resolve unique and/or complex rescue situations" (NFPA, 2004). Lacking official regulations on technical rescue, fire service administrators sought evidence for establishing formal training and equipment standards. The NFPA being the association that sets national consensus standards chose to create what is now known as NFPA 1670. This national standard should be relied on for a definition since it is considered the baseline for establishing technical rescue services (Collins, 2006).

Many important facets of technical rescue, as they relate to ascertaining what level of service the Hood River Fire Department is expected to provide to the community, have been identified. In Hood River, outdoor sports have grown into the reason for tourists to vacation and live in the community. The popularity of adventure sports is creating more opportunity to find people on cliff edges, stuck in fast water, and in other wilderness dilemmas (Collins, 2006). A simple search of YouTube videos using the term "kayaking in Hood River" discovers outdoor enthusiasts in predicaments in the community. Additional searches substituting paddle boarding,

rafting, windsurfing, or kite boarding for kayaking reveals even more activities on the rivers around the community.

Hood River has become a destination of choice for water sport enthusiasts from around the world. Essentix (n.d.) reports that Hood River is the "Wind surfing capital of the world." Wind surfing is just one of the main uses of the mighty Columbia River. Kite boarding, using a variation of a wakeboard and a stunt kite to propel the rider across the water, is also found in Hood River. Hood River is known as one of the most popular kite boarding destinations in the world (White, n.d.).

This type of recreational use is mixed with commercial use of the river. White (n.d.) states that kite boarding on the Columbia River is dangerous due to barges, currents, and hidden floating debris and it should "only be tried by expert riders." However, in an interview with Adam Lapierre, Vice President of the Columbia Gorge Kite Boarding Association, he stated that kite boarding is relatively safe, compared to windsurfing. "Windsurfers have a mast that can come down and hit them on the head. In fact, there has not been a kite boarder fatality on the Columbia River yet, as compared to a couple windsurfers per year" (personal communication, July 21, 2011).

However, there have been numerous fatalities and countless injuries from kite boarding around the world. Over the past five years, there has been an average of 16 fatalities per year, with 2009 having as many as 23 deaths (Iossi, 2011). In 2008, Christina Bockius of Hood River was killed while kite boarding in Mexico. She was a well experienced kite boarder and respected in the sport (Aflleje, 2008). Iossi (2008) also states that for every one of these fatalities there are possibly 100 severe, life threatening injuries.

Lapierre did say that pre-season training for the fire department and kite boarders would be a welcome proposition. Teaching the firefighters how to effectively manage the kites and equipment for the sport would greatly benefit the rescuer. Also, teaching the kite boarders some simple first aid techniques and safe handling of patients with suspected spinal injuries could help minimize further injuries.

Also in 2008, a windsurfer died on the Columbia River. It is expected that he was doing aerial tricks and his mast struck him in the head, became unconscious, and drowned in the water. A rescue attempt brought him to shore, but resuscitation was unsuccessful (Preusch, 2008). Katie Crafts, President of the Columbia gorge Windsurfers Association, agrees that windsurfing is a dangerous sport. “People are nervous when they are out there. They feel on their own when they are on the water. There is definitely a need for rescue services to be available” (personal communications, July 20, 2011). She feels the windsurf community is aware that the rescue resources may be limited, but that they take the risk anyway. She also believes that the fire department would receive great support from the windsurfing community if a water safety or rescue program was started.

Another water sport that is gaining in popularity in Hood River is white water rafting and kayaking. Both the Hood River County Chamber of Commerce (HRCCC) and Hoodlivin agree that the Columbia River Gorge offers world class whitewater kayaking on a year round basis (HRCCC, 2010; Hoodlivin, n.d.). In talking with John Hart, owner of The Kayak Shed, a whitewater kayaking store and guide service, he believes the rivers get used routinely, but more heavily in the winter and spring due to high water flows (personal communication, July 21, 2011). He is confident that the kayakers take care of themselves and rarely need rescue

assistance. He did express a concern for fishermen on the river and that they may be getting themselves into more precarious places due to relaxed fishing regulations.

Water sports are not the only activities in Hood River that may demand technical rescue services. There are many small breweries and distilleries that have vats and tanks that are considered confined spaces. In an interview with Patty Elkins, Safety Officer for Hood River Distillers, she said they enter their tanks approximately two times per year for regular maintenance (personal communication, July 21, 2011). “No one is trained for rescue,” she says. “We would need you to go in after an injured or ill worker.” Jim Kelter of Full Sail Brewing Company agrees. Full Sail has fall arresting devices for their workers when they enter the confined space, but if a worker gets injured and is off of the fall protection device, the fire department is expected to respond and provide rescue services (personal communications, July 25, 2011). Pendley (2006) believes this statement is true for most industrial sites.

Confined space work in the public sector is also common. Dave Smock, Public Works Foreman for the City of Hood River said that the crews are in confined spaces about three times per week (personal communication, July 25, 2011). However, those spaces are not permit enter, they are “not sure how [they] would retrieve [the] employee if they fell or had some sort of incapacitating injury.” He also said that if the confined space is a *permit entry* space, meaning a standby team, air monitoring, and emergency procedures are required to be in place prior to entering the space, the employees are on a tripod retrieval system. This allows them to retrieve the worker if something goes wrong.

Unfortunately, three incidents in 2010 provide examples of firefighters risking a confined space rescue at the expense of their safety. In Middletown, OH, three firefighters nearly perished

when attempting a rescue of a worker down in a manhole (Goodwin, 2010). Later the same month in Liberty Township, MD, a citizen and two firefighters were injured and the original victim died while trying to rescue them from a deep pit. Lastly, in Tarrytown, NY, a worker collapsed in a manhole and a firefighter died while attempting to rescue the worker due to exposures in the confined space (Goodwin, 2010). Firefighters will almost always attempt a rescue, even though they haven't been trained to perform the service.

Construction in Hood River is also on the rise. This creates another activity that could have a need for technical rescue. Collins (2006) says that trenches and excavations are a typical emergency, causing numerous injuries, near misses, and about 100 worker deaths per year. This type of accident is more widespread in communities with a large amount of construction and urban development occurring. Gary Lindemyer, Construction Inspector for the City of Hood River, says that typically four trenches are open in a week (personal communication, July 22, 2011). In the week prior to the conversation with Lindemyer, three trenches were deep enough to require shoring. However, one of them did not have shoring because it was a private owner performing the work.

This is a perfect example of the public believing that the fire department can fix anything. If something goes wrong, the fire department will respond and use the best rescue gear to quickly, efficiently, and professionally make the rescue (Pendley, 2006). Don Annotti, owner of Corp Inc. Construction said in an interview that their emergency procedures are to call 911 if there is a trench collapse (personal communications, July 25, 2011). They are routinely in trenches over 10 feet deep, but multiple safety measures are in place prior to workers getting in

the trench. However, accidents happen and emergency services are expected to respond to perform a rescue operation.

The expectation that the fire service will provide technical rescue operations is common throughout the United States. Collins (2006) believes that fire departments have grown to become the all hazards emergency services provider that everyone expects. As the main mission of the fire service proclaims, we are in the business of saving lives. The public assumes that the fire department is trained to extract victims from whatever situation they get into. Collins (2006) and Pendley (2006) both agree that fire departments have a legal and ethical obligation to provide services to the community that has come to expect so much.

The public has come to trust that the fire service will respond quickly to all situations and provide some type of rescue. This has come about due to the increasing number of successful rescue operations that have been highly publicized (Collins, 2006). The terrorist attacks in New York City on September 11, 2001, the heroic efforts during the aftermath of Hurricane Katrina, and the numerous local rescues that are seen on small television stations throughout the United States show the public that the fire service can perform rescues.

On May 8, 2011 the Pompano Beach (FL) Fire Department responded to a man trapped under the sand. The fire crews responded and did what they could to help the individual while waiting for a technical trench rescue team from a neighboring community (Gurr, 2011). The victim, a 19-year old from Austria, was rescued and had no long term effects. Even though the Pompano Beach Fire Department was not trained in trench rescue, they were summoned and performed as needed.

Locally, Dr. Charles Beck, Superintendent of Public Schools in Hood River County, said that he believes a fire department our size should provide all types of technical rescue (personal communications, July 20, 2011). He believes that surface water rescue, confined space, and trench rescue are of the highest importance. This is in line with Collins (2006) that says that the public is used to seeing firefighters step off of fire engines wearing wetsuits, personal floatation devices, and water rescue helmets.

However, some community leaders in Hood River disagree. In an interview with David Meriwether, Hood River County Administrator, he said the fire department should only be focused on the areas that the Sheriff's Office does not (personal communication, July 26, 2011). He believes the fire department should focus on confined space and trench rescue and leave water and rope rescue to the search and rescue units in the County. Jeff Nicol, a Hood River City Councilor, agrees with Meriwether. He feels that the fire department should only focus on industrial rescue and let other agencies provide water rescue services (personal communication, July 21, 2011).

Effective emergency management is vital to the well-being of a community. Fire departments are a key provider of emergency management (United States Department of Homeland Security, 2011). However, expectations of technical rescue services do not come at a small price. The time and money put into establishing a full rescue program can exceed $50,000 and take several months of training and preparation (Pendley, 2006). Most departments break thier start-up costs into phases, strategizing which areas of technical rescue to implement first. Rope rescue equipment being the basis of most other technical rescue operations can start out at $12,000 for a 14-person team.

Besides being money and equipment intensive, technical rescue is dependent on a highly trained, well-staffed team. Gurr (2011) states that a primary lesson learned from the Mother's Day trench rescue on Pompano Beach is that you can never have enough firefighters on scene of a rescue. That one rescue had 52 emergency responders working on various aspects of the incident.

The most important item to consider in establishing a technical rescue team is the members of the team. People are the most valuable resource, but also the most expensive. Providing quality training and continuing education to team members is required. Unfortunately, departments that do not have a large enough budget to commit to the creation and maintenance of a technical rescue program tend to have a team with lower capabilities (Pendley, 2006).

Training is a highly important focus of technical rescue teams. The training cannot be generic in nature. Specialized training that is both intelligent and realistic is critical to success. Without these realistic training scenarios, rescuers will not be able to locate and extricate victims with serious risk to themselves (Collins, 2006). There are numerous options for high quality training, each having their own merits. What is done for one department, may not work in another.

However, one point is made clear in the literature, training has to be on going and specialized. Shupert (2011) feels that there can never be enough on-the-job training given to rescue professionals. Especially since there is so much risk in rescue operations, training and preplanning are focused on more than normal. Also, it is one thing to get a team started and trained, but the more difficult task is to sustain the team through proper training and equipment upgrades.

Training is more than just a nice item to have, it is a requirement. Oregon Occupational Safety and Health Administration (OR-OSHA) outlines the requirement for confined space in their standards. Oregon Administrative Rule (OAR) 437-002-0182 (36) (c) (A) states that, at a minimum, employers that will respond to emergency calls for rescue must "train responders to recognize inherent confined space hazards before assigning or attempting and related duties in confined space rescues" (OR-OSHA, p. L-16).

The level being described above is a general awareness of confined space. In NFPA 1670 (2004), three levels of training and knowledge for technical rescuers are outlined. These levels are awareness, operations, and technician. Awareness level responders are able to recognize a hazardous situation and contact the appropriate response teams and personnel. Operations level responders are able to utilized equipment to perform specific tasks outlined in subsequent chapters. Technician level responders are able to utilize advanced techniques to perform technical rescues.

Each of the above levels of training builds upon the previous, with technician level training taking 40 or more hours to complete (Goodwin, 2010). However, not all agencies can afford to be at the technician level in all areas. At a minimum, the awareness level of training should be given to all firefighters. Goodwin says "awareness training is essential in today's fire service as we are called upon to perform at various types of rescues" (p.116).

Firefighters never know what the next emergency will bring. Speier (2011) tells of a time when a missing child search was being managed by a federal law enforcement agency. Knowing that his department provided confined space rescue, the law enforcement agency asked them to conduct a search of 1,750 feet of storm drain. They were able to assist in the search due to

specific training in storm drain operations and water emergencies when in a storm drain system. The appropriate training and equipment allowed this fire department to affect a search operation when requested.

Not only is training important, but having the appropriate rescue equipment for the technical rescue specialty is paramount. Collins (2006) identifies that technical rescue being a very specialized field requires the use of unique equipment for the operations. The equipment used by technical rescue teams is often not used for any other purpose due to its special nature. This causes the need to carry equipment that may not be part of a standard firefighting operation.

This cost is one that administrators of fire departments have a hard time adding or keeping in the budget. Since these pieces of equipment are typically suited for one purpose, chief officers are faced with justification of replacement and maintenance on equipment that might not be routinely utilized (Pendley, 2006). Even with proper planning and preparation, not all departments can afford to fully outfit a technical rescue team. Collins (2006) believes that these agencies cannot possess all of the internal resources necessary to properly and safely manage a full range of technical rescue services.

Alternatives to funding the technical rescue program are necessary in smaller agencies. Garber (2007) reports that substantial funding must be identified in order to sustain a technical rescue team. This can come in the way of fees, partnerships, and other alternative funding mechanisms. However, thorough research into the funding source is different for each jurisdiction. Partnerships and mutual aid agreements that are already in place in most fire departments can ease the burden of providing all technical rescue services alone (Collins, 2006).

The literature reviewed has influenced this research project by identifying arguments for and against various levels of technical rescue. Activities were identified during the review process that might require technical rescue services to be provided in Hood River. Also, there were arguments for certain types of services, but against others. This influenced the research by looking deeper into certain types of technical rescue recommended in the literature.

The expected level of technical rescue services was also an item discovered in the literature review. Most agencies across the United States have some level or type of rescue program. Residents, business owners, and government officials in Hood River indicated that some level of technical rescue provision is expected of the fire department. However, there were also arguments against formalized training and service provision from some business and organizational leaders.

Finally, research on the resources needed to provide technical rescue revealed a substantial start-up cost and education requirement. Even though these items are expensive and difficult to realize, the literature argued that some level has to be provided. Partnerships could be explored to help offset the expense, however, some level of ownership would need to be realized by the fire department as the community expects a quick and efficient, professional response.

As the public dials 911 and requests emergency service, they are defining the department's mission statement (Collins, 2006). It is undeniable that technical rescue is part of emergency response from fire departments across the United States. The public expects the fire department to respond in their time of need, for fire, emergency medical, hazardous materials, and technical rescue emergencies.

Procedures

The first part of this research project was a literature review in January 2011. The research included a review of past Executive Fire Officer applied research papers at the National Fire Academy's Learning Resource Center. It continued with a search of internet-cataloged literature, the fire department library, and current periodical reviews.

Additional literature research was conducted by using the Google search engine and search engines located in the online Learning Resource Center of the National Fire Academy. Terms used in the search included: technical rescue, confined space rescue, windsurfing fatalities, kite boarding fatalities, adventure sports push the limits, kite boarding death Hood River, windsurfing death Hood River, kite boarding injuries 2010, technical rescue who is responsible, heights urban renewal Hood River, census information City of Hood River, or, NFPA 1670, visit Hood River OR, sports in Hood River OR, activities in Hood River OR, and technical rescue in Hood River OR. In internet search of YouTube videos was also conducted using the search terms kayaking in Hood River, stand up paddle boarding in Hood River, and rafting in Hood River.

Only documents with a publication date of less than ten years old were used, primarily trying to stay within the past 5 years. The purpose of the literature review was to find background information and past relevant research on the research questions of (a) what activities occur in Hood River that might require technical rescue services, (b) what technical rescue services do people in the community expect the HRFD to provide, and (c) what resources are needed to provide technical rescue services in Hood River?

The next procedure used in this research was a simple, public cross-section survey (Appendix A). The questionnaire consisted of three multiple choice questions. The questions asked were used to collect original results concerning the research question what technical rescue services do people in the community expect the HRFD to provide? The survey was sent electronically to a cross section of 72 members of the community during the month of July 2011. The recipients were specifically chosen to avoid the survey being sent to individuals associated with fire services in Hood River. The cross section included a range of citizens in Hood River from teachers and the Superintendent of Public Schools to business owners, government officials, and private residents. The individuals selected represented multiple ethnic groups, income levels, and occupations.

The survey participants had the research project and a definition of technical rescue briefly explained to them. Examples of various technical rescue services were provided with a simple example of a condition or location requiring the use of the specialized service. The participants were asked to return the survey with their answers by email. The survey results were compiled and placed in a chart to be reviewed (Appendix B).

The final part of the research was to conduct interviews with individuals that had a higher potential for use of technical rescue services. The informal interviews took place in July 2011 over the phone and in person, depending on the individual's availability. The interviews were conducted to answer the research questions of (a) what activities occur in Hood River that might require technical rescue services and (b) what technical rescue services do people in the community expect the HRFD to provide?

People interviewed from industrial businesses or agencies included Dave Smock, Public Works Foreman for the City of Hood River; Gary Lindemyer, Construction Inspector for the City of Hood River; Patty Elkins, Safety Officer for Hood River Distillers; Don Annotti, owner of Corp Inc. Construction; and Jim Kelter, Operations Manager for Full Sail Brewing Company. Recreational related interviews were conducted with Katie Crafts, President of the Columbia Gorge Windsurfing Association; Adam Lapierre, Vice President of the Columbia Gorge Kiteboarding Association; and John Hart, owner of The Kayak Shed. The results of the interviews were used to help guide the direction of the research and provide original information regarding technical rescue specifically in Hood River, OR.

Limitations of this research project include the lack of more diverse survey population and the lack of targeted surveys for specific special interest groups. Also, interviews with state regulatory agencies could have been done to provide insight into regulations that govern technical rescue.

A broad, community-wide survey could be completed to gain a greater cross section of Hood River. This could be done at community functions, through email lists, and via various websites and blog sites. Also, the Columbia Gorge Windsurf Association offered the use of their email list of 1,200 windsurfers that live and/or recreate in Hood River. This list could prove useful in the collection of specific comments regarding technical rescue services to the windsurf community. Other targets email lists and community organizations have the same ability to contact specific group of recreationalists.

Results

What Activities Occur in Hood River that Might Require Technical Rescue Services?

Interviews with water sport industry experts provided a mixed opinion about the need for technical rescue services. Katie Crafts of the Columbia Gorge Windsurfing Association (personal communication, July 21, 2011) says that the windsurfers are nervous when they are on the water. The athletes often get tired and need assistance, sometimes waiting long periods of time to get help from other windsurfers or kite boarders. However, Columbia Gorge Kiteboarding Association Vice President Adam Lapierre feels that kiting is safe and there is a real need for vast technical rescues for that sport in particular. He feels windsurfing is much more dangerous and focus should be placed on that industry (personal communication, July 21, 2011). John Hart of The Kayak Shed also feels that kayakers take care of themselves. Rescue plans include group or individual rescue and rarely would require a technical rescue team (personal communication, July 21, 2011).

Water sports are not the only activity that may require technical rescue in Hood River. Upon talking with industrial representatives and City of Hood River Public Works employees, non-recreational industrial activities have a high potential for needing technical rescue also. Patty Elkins, of Hood River Distillers, says that they enter confined spaces to perform maintenance on large tanks (personal communication, July 21, 2011). Jim Kelter of Full Sail Brewing Company agrees with Elkins. Their workers enter large vessels on a regular basis, but are usually attached to a fall protection system (personal communication, July 25, 2011).

Dave Smock with the City of Hood River Public Works Department says that his workers are in vaults multiple times per week (personal communication, July 25, 2011). However, most

of the spaces are not considered permit-entry spaces and pose no real threat unless a worker is injured in some manner. Gary Lindemyer, Construction Inspector for the City of Hood River, says that open trenches occur in the city "quite frequently" (personal communication, July 22, 2011). Most of the trenches are opened by qualified contractors that have a requirement to place shoring safety devices in the trench prior to workers entering. However, one out of three trenches the week prior to the interview was entered by a homeowner, without proper shoring.

What technical rescue services do people in the community expect the HRFD to provide?

Interviews that were conducted proved the same results in Hood River. When speaking to Katie Crafts (personal communication, July 21, 2011) she stated that "people expect that they will be rescued when on the water." She also said that the windsurfing community would be a supporter of any established water safety or rescue program on the Columbia River. Patty Elkins at Hood River Distillers identified that the fire department is expected to respond when something goes wrong with a worker inside a confined space (personal communication, July 21, 2011). The safety manual even directs them to call 911 and wait for the fire department to perform the rescue. Jim Kelter agrees with Elkins. His employees are on a retrieval system when entering confined spaces, but if an injury happens, they are planning on the fire department to conduct the rescue (personal communication, July 25, 2011).

Results of the survey agreed with the literature review and interviews. Of the 72 people that were included in the survey, only 23 or 32% replied. The first question asked was "is it your understanding that the Hood River Fire Department provides some or all of the above listed Technical Rescue services?" Of the respondents, 91% believe we are providing some level of technical rescue services. One written comment regarding this question summarizes the others

that were received. It reads “I have no idea if you do any of them (rescue services) but I certainly hope and assume that you do all of them.”

Question two of the survey was “if yes, which services do you understand we provide?” This question was asked to solicit information from the respondents about their belief of what the fire department already does. They were given five options for answers. 83% of the respondents felt the fire department already provides confined space rescue and 65% believe they provide trench rescue. Water rescue – surface was next with 57%, followed by 52% thinking the department provides high angle rescue, and lastly water rescue – whitewater was last with 35% of the respondents feeling we currently provide that service. Written comments regarding this question were received also. Multiple comments were made about Hood River Fire Department providing all of the services. One such comment is “I would guess by the size of your dept. and the terrain that you cover that you perform all of these operations. I believe that all are necessary and that you should have the equipment and training to do all of them.”

Question three asked “which services do you feel the Hood River Fire Department should provide?” Confined space rescue was the service most expected by the public for the department to provide with 96% selection rate. The second most expected service was shared between trench rescue and water rescue – surface, with 83% of the respondents feeling the department should provide those services. Lastly, both water rescue – white, and high angle rescue garnered a 70% selection rate. Comments received in this question were varied. One in particular states that “the City of Hood River should (if it is not already!) be able to respond to all types of the rescue situations listed above because of its physical/geographical setting. The City is situated near a major river (Columbia) and the Hood River (small, but fast and dangerous) with easy access to

all, including children." Another respondent says "in our area where all of these scenarios are very likely to happen I feel you should be prepared and trained to perform all of them (rescue services)." However, another respondent states that "I believe the Hood River Fire Department should have the basic knowledge/training on all five areas. But in reality with staffing, time, and money shortages this is probably not tangible at this time."

What resources are needed to provide technical rescue services in Hood River?

This research question was mainly answered with literature review; however a few of the interviews resulted in feedback on the resources needed. When interviewing John Hart regarding kayaking in Hood River, he was asked about the availability other trained water rescue professionals in the area (personal communication, June 21, 2011). His reply was that there are some amazing professionals in the area. He went on to say "if you do go down the route of having a river rescue team, make sure they are a solid group, comfortable and knowledgeable with swift water rescue."

Also, when talking to Gary Lindemyer from the City of Hood River concerning trenches, he said "unless you have a crew with the proper training, basic medical attention after extraction is all I would expect … the last I checked, the statistics show there are more 'rescuers' killed attempting to help than 'original' victims" (personal communications, July 22, 2011). Dave Smock, Public Works Foreman identified a few equipment items they have that are specific to confined spaces. "Any manhole [entered] we setup our tripod and we would be able to do the retrieval ourselves…we also check with our atmospheric tester the air and explosive levels of the manhole" (personal communication, July 25, 2011).

Discussion

The literature review and original research support the premise that the Hood River Fire Department should be providing technical rescue services. It is this researchers opinion that the levels for each facet of technical rescue will differ, but never fall below the awareness level as outlined in NFPA 1670 (2004).

In Hood River, outdoor sports have grown into the reason for people to vacation and live in the community. The popularity of adventure sports is creating more opportunity to find people on cliff edges, stuck in fast water, and in other wilderness dilemmas (Collins, 2006). Hood River is known as the windsurfing capital of the world (Essentix, n.d.) and as one of the most popular kite boarding destinations in the world (White, n.d.). Both the Hood River County Chamber of Commerce (HRCCC) and Hoodlivin agree that the Columbia River Gorge offers world class whitewater kayaking on a year round basis (HRCCC, 2010; Hoodlivin, n.d.). Also, a YouTube search for "kayaking in Hood River" finds numerous videos of kayakers being adventurous in the area's rivers. It also provides links to other videos documenting high-risk activities in rivers that are not sanctioned sports, but adventure seekers looking for the latest thrill.

There are many documented injuries and fatalities from these outdoor activities. The Oregonian reported two such fatalities within five months of each other in 2008 (Aflleje, 2008 & Preusch, 2008). A windsurfer was killed on the Columbia River in July and a kite boarder from Hood River was killed while kiting in Mexico. Also, Iossi (2010) reports multiple kite board fatalities every year, averaging 16 per year. He estimates that there are 100 times those numbers of injuries. It is this researcher's opinion that these injuries happen in Hood River, yet have not

risen to level of alarm yet. However, preparing for these emergencies is a high priority so when they do happen, the fire department can meet the communities expectations.

The industrial side of Hood River also participates in activities that deem technical rescue necessary. Pendley (2006) says that all industrial facilities in the jurisdiction that have confined spaces pose a hazard. This is confirmed by interviews with Elkins (personal communication, July 21, 2011) and Kelter (personal communication, July 25, 2011). Both facilities have large tanks that employees enter on a regular basis for maintenance. The fire department is the expected responder to extricate someone that is ill or injured.

Increasing construction in Hood River also poses a risk. Trench and excavation collapses claim nearly 100 workers yearly (Collins, 2006). These types of accidents are more prevalent in communities experiencing high levels of construction and renovation. The Hood River News reports that a new Heights Urban Renewal project is beginning to replace old infrastructure to include sewer, water, and storm lines in Hood River (Raefield-Gobbo, 2011). Gary Lindemyer confirmed these high levels of activity, as an average of four trenches are opened every week in the City of Hood River (personal communication, July 22, 2011). This researcher believes this activity substantiates the need for trench and confined space technical rescue services in Hood River.

Collins (2006) says that people expect to be rescued from practically any situation at any time. The research confirms this. While interviewing Katie Crafts, she mentioned how the windsurfers are nervous when on the water and expected rescue if there is a problem, but they are not sure where it would come from (personal communication, July 21, 2011). It is this researcher's opinion that the expectation for rescue is that the fire department will respond.

Both Pendley (2006) and Collins (2006) agree that the public expects the fire department to respond to all emergencies and provide efficient, professional rescue services. This has grown out of an increasing display of successful rescues and fire departments answering the call for help. No longer are citizens caught off guard by firefighters getting out of fire engines dressed in wetsuits and personal floatation devices. This practice is considered routine fire department operations and expected by citizens.

However, interviews with both Lapierre (personal communication, July 21, 2011) and Hart (personal communication, July 21, 2011) suggest that technical rescue services for kite boarding and kayaking are not necessarily needed or expected. Hart said that kayakers are on their own on the river and understand this concept. They do not expect anyone other than themselves or the group they are with to provide water rescue services. Hart was also concerned about the quality of the team and the resources it takes to make a good team.

Lapierre stated that the kite boarders were pretty confident when on the water and did not need rescue services. He stated that windsurfing is a much more dangerous sport due to the mast involved in the equipment and its potential for hitting a rider in the head, rendering the unconscious in the water. This researcher disagrees with Lapierre's assessment of the risks of kite boarding. In 2008, Aflleje wrote a story about a Hood River resident killed while kite boarding in Mexico. She was a well experienced kite boarder and was taken by a gust of wind and thrown to the ground, then dragged down the beach. Also, the data presented by Iossi (2006) lead this researcher to believe that kite boarding is a sport with high potential for injury and death.

With these activities occurring in Hood River, the research and literature review suggest the establishment of technical rescue teams. However, the resources that full teams require are substantial and can be cost prohibitive. Pendley (2006) explains that these types of incidents utilize equipment that is very specialized, expensive, and suited for only one purpose. Chief Officers tend to be weary when trying to establish teams since the cost is so high. He estimates that the potential start-up costs can be around $50,000 for a full functioning team. Unfortunately, if you have a lower budget, your team will have lower capabilities.

The equipment list for technical rescue teams can be quite extensive. Collins (2006) lists nearly 13 pages of equipment that typical heavy rescue teams carry. This researcher feels this list is overly extensive, however, understands that technical rescue equipment is different than other equipment found on a fire engine.

In addition to the resource requirements for equipment, properly trained personnel are also a must. NFPA (2004) and OSHA (2008) outline requirements for training of individuals use for technical rescue incidents. Individual technician courses for technical rescue aspects can be over 40 hours per discipline (Goodwin, 2010). However, awareness level training is an option to get everyone trained to recognize the hazards and implement the correct response. In this researcher's opinion, awareness level training should be completed for all firefighters. Additional levels of training can be added to specific teams in varying disciplines. NFPA 1670 should be followed to provide the most accurate training and equipment standards in the fire service. However, only those types of technical rescue deemed high priority by targeted needs assessment should be trained on above the awareness level.

The research and literature suggests that Hood River has a substantial number of activities that might require technical rescue services. It is this researcher's opinion that the majority of people in the community expect the Hood River Fire Department to respond to rescue incidents and provide professional expertise. Finally, the research suggests that the resources required to establish a technical rescue team are many, both equipment and trained personnel. However, in order to protect the well-being of the community, effective emergency management and incident response is paramount.

Recommendations

After research and literature review, this researcher has developed specific recommendations that will help solve the problem statement and meet the purpose of this research. These recommendations will further the Hood River Fire Department's mission to Prevent, Prepare, and Protect.

Based on this research, the Hood River Fire Department should:

1. Initiate training to the awareness level for all categories of technical rescue that pertain to the community of Hood River. NFPA 1670 and OSHA rules should be used as a guide to seek the appropriate training.

2. Purchase equipment necessary for awareness level responses. This minimal purchase will start the program and allow firefighters to operate with the tools needed during an emergency.

3. Initiate program development for Surface Water Rescue services to water related activities on the Columbia River. The amount of activity occurring on the Columbia

River with the numerous water sports creates a large potential for technical rescue. Since the Hood River Fire Department does not currently provide water rescue services, there is a large gap in service delivery. The department should work with the Columbia Gorge Kiteboarding and Windsurfing Associations to develop a course of action for future rescue provision. The department should also work with the Hood River County Sheriff's Office and any other agency that currently provides services on the water. The level of service provision should be at least operations, if not technician.

4. Initiate program development for Confined Space and Trench Rescue. Work with the Public Works department to establish the program, equipment, and training standards that will offer an increased level of protection to the City of Hood River. Rope rescue training will need to be part of this training and should be trained to the operations level.

5. Initiate a budget study for equipment needed to establish an awareness level program aligned with NFPA 1670 and operational programs for Confined Space, Trench, and Surface Water Rescue. The equipment needs list can then be turned into a budget proposal for review by the City Manager and Council.

6. Seek out partners in the community that have specialized skills in technical rescue. Use these partners in the program development and implementation. Offer the opportunity for them to be part of a progressive program and to help the community where they live, work, and recreate.

Recommendations for future researchers of this topic are to look into ways different community organizations, both public and private, can partner to create more synergistic approaches to technical rescue. The economic impact of starting a program can cripple any department. If the program could be shared between multiple agencies, the potential for cost sharing is higher. Also, future researchers should look into how to utilize individuals in your community that have specialized training, but are not part of the fire department. Involvement of these professionals is not only important, but smart.

Technical rescue services are an important part of any fire department's function. Determining what level to provide is an essential first step to providing the services that citizens have come to expect. The fire service is in the business of saving lives. It is only logical to include technical rescue in the list if services provided to the community. They depend on firefighters whenever they are in need.

Reference List

Aflleje, D. (2008, December 12). Hood River woman dies in kiteboarding accident [Electronic version]. *The Oregonian.* Reterieved on July 26, 2011 from http://www.oregonlive.com/news/index.ssf/2008/12/hood_river_woman_dies_in_kiteb.html

Collins, L. (2006). Rescue operations. In R.S. Barr & J.M. Eversole (Eds.), *The Fire Chief's Handbook* (pp. 553-728). Tulsa, OK: PennWell Corporation.

Cubit Planning. (2011). *Hood River city census 2010 Data – Population.* Retrieved July 25, 2011, from http://www.cubitplanning.com/city/11328-hood-river-city-census-2010-population

Essentix, Inc. (n.d). *Welcome to Hood River, Oregon.* Retrieved July 17, 2011 from http://www.el.com/to/hoodriver/

Garber, R.S. (2007, June). *Alternative resources to assist in providing techincal rescue services with the least capital.* Emmitsburg, Md: National Fire Academy.

Goodwin, S. (2010, December). Confined-space rescue, Part 1 – Is it worth killing yourself over? *Firehouse Magazine.* 35 (12). 114-116.

Gurr, M. (2011, July 13). *Mother's Day trench rescue at the beach.* Retrieved on July 21, 2011 from http://www.fireengineering.com/index/articles/display/4169269839/articles/fire-engineering/tech-rescue/usar/2011/07/mothers-day-trench.html

Hood River County Chamber of Commerce (HRCCC). (2010). *Rafting and Kayaking.* Retrieved July 17, 2011from http://hoodriver.org/rafting-kayaking

Hoodlivin. (n.d.) *Rafting Information.* Retrieved on July 17, 2011 from http://www.hoodlivin.com/paddling/

Iossi, R. (2010, January 24). Kiteboarding injury log. Message posted to http://www.kiteforum.com/viewtopic.php?t=2368547&p=685472

National Fire Protection Association. (2004). *NFPA 1670 Standards for operations and training for technical search and rescue incidnets.* Quincy, MA: author.

Oregon Occupational Safety and Health Administration. (2008). *Oregon occupational safety and health standards:Divion 2, general occupational safety and health rules.* Salem, OR: Author.

Pendley, T. (2006). Technical rescue. In J.M. Buckman III (Ed.). *Chief Fire Officer's Desk Reference* (pp. 335-343). Sudbury, MA: Jones and Bartlett Publishers.

Preusch, M. (2008, July 23). Windsurfer responds to Columbia River crisis [Electronic version]. *The Oregonian.* Retrieved on July 26, 2011 from http://www.oregonlive.com/news/oregonian/index.ssf?/base/news/1216781724123860.xml&coll=7

Raefield-Goob, J. (2011, May 25). Heights urban renewal on front burner [Electronic Version]. *Hood River News.* Retrieved, July 25, 2011, from http://www.hoodrivernews.com/HRNNews45.shtml

Shupert, S. (2011, July). Leader of the pack: Developing & leading a technical rescue crew. *FireRescue Magazine.* 29 (7). 48-53.

Speier, A. (2011, May). Underground movement: The hazards invovled with storm drain search operations. *FireRescue Magazine.* 29 (5). 56-61.

United States Department of Homeland Security. (2011). Unit 1: Introduction. *Executive analysis of fire service operations in emergency management student manual.* (p. SM 1-6, SM 1-7). Emmitsburg, MD: Author.

United States Fire Administration (USFA). (2010). *Strategic plan*. Emmitsburg, MD: Author.

White, M. (n.d.). *Hood River – World class kite boarding.* Retrieved on July 17, 2011 from http://web.oregon.com/trips/hood_kiteboard.cfm

Appendix A: Survey

Hood River Fire Department Technical Rescue Study

I am writing to request your assistance with a research project I am completing for the National Fire Academy. I am exploring what level of Technical Rescue Services the Hood River Fire Department should provide to the people that live, work, and recreate in Hood River.

Technical Rescue is defined as any incident having at least one victim trapped, buried, confined or otherwise endangered in a location that requires rescuers with specialized skills and training to extricate them. These incidents include but are not limited to:

1. Trench Rescue (an excavation that is deeper than it is wide)
2. Confined Space Rescue (restricted entry and exit points with potential atmospheric deficiencies)
3. Water Rescue - Surface (surface rescue in a slow moving river or lake – Columbia River and sloughs)
4. Water Rescue – Whitewater (water rescue in a fast moving river and/or rapids – Hood River and tributaries)
5. High Angle Rescue (utilizing ropes and skills to raise or lower a person to a point of easy access).

If you could please simply reply back to this email answering the three following questions, I would greatly appreciate it.

1. Is it your understanding that the Hood River Fire Department provides some or all of the above listed Technical Rescue Services?
2. If yes, which services do you understand we provide:
    a. Trench Rescue
    b. Confined Space Rescue
    c. Water Rescue – Surface
    d. Water Rescue – Whitewater
    e. High angle Rescue

3. Which services do you feel the Hood River Fire Department should provide:
    a. Trench Rescue
    b. Confined Space Rescue
    c. Water Rescue – Surface
    d. Water Rescue – Whitewater
    e. High angle Rescue

Any other comments about technical rescue services are appreciated. I will be tabulating these responses and including the results in my Applied Research Project.

I appreciate your time.

Sincerely,

Devon J. Wells

Fire Chief

Hood River Fire

Appendix B: Survey Results

Questions:	YES	NO			
Is it your understanding that the Hood River Fire Department provides some or all of the above listed Technical Rescue Services?	21	2			
	Trench	Confined Space	Water – Surface	Water – White	High Angle
If yes, which services do you understand we provide?	15	19	13	8	12
Which services do you feel the Hood River Fire Department should provide?	19	22	19	16	16