TECHNICAL LARGE ANIMAL EMERGENCY RESCUE

EXECUTIVE LEADERSHIP

By: Ron Lindroth

Poudre Fire Authority &

Livermore Fire Protection District

Ft. Collins, Colorado

An applied research project submitted to the National Fire Academy as part of the

Executive Fire Officer Program.

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Appendix D Not Included. Please visit the Learning Resource Center on the Web at http://www.lrc.dhs.gov/ to learn how to obtain this report in its entirety through Interlibrary Loan.

Certification Statement

I, Ron Lindroth, certify that this paper constitutes my own product, that where 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.

Signed:_____

Abstract

Large animal rescue is an infrequent, dangerous, emergency incident that is often mishandled by the fire service unless specific training has been received. The purpose of this action research was to determine if the establishment of a Technical Large Animal Emergency Rescue Team (TLAER) would benefit firefighters and the public. Research sought to identify local emergencies involving large animals; how other jurisdictions handled similar calls; and what training, equipment, or policies firefighters needed to safely and successfully mitigate large animal emergencies. Data review and interviews found that local fire departments are not routinely prepared to effectively handle the wide array of large animal incidents they are responding to. The establishment of a TLAER program to increase firefighter and public safety, decrease iatrogenic injuries and mortality in animals, and provide an increased level of public service was recommended.

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TECHNICAL LARGE ANIMAL EMERGENCY RESCUE

Introduction

The problem being researched in *Technical Large Animal Emergency Rescue* is currently the Poudre Fire Authority (PFA) and Livermore Fire Protection District (LFPD) have no protocols, formal training or specialized equipment to rescue horses or cattle that are at risk of serious injury or loss of life due to an accident, physical, or fire entrapment. Due to the increased urban demographics of PFA, firefighters often do not have the agricultural background or knowledge to safely and effectively mitigate these types of rescues. However, a strong agricultural component still exists within the rural areas of the districts and incidents of this type continue to occur. The purpose of this applied research project is to determine if the establishment of a Technical Large Animal Emergency Rescue Team (TLAER) would be of benefit to firefighters and district residents, and if so, how the team would function.

This action research project seeks to answer the following three research questions:

1. What type of emergencies involving large animals have local firefighters responded to?
2. How have other fire service jurisdictions effectively handled large animal rescue incidents?
3. What training, equipment, operational directives or other needs must be provided to PFA firefighters to safely and successfully mitigate large animal emergencies?

Background and Significance

Through-out the author's 30 year rural fire service career, numerous incidents involving large animals have been encountered; including horses, cattle, lamas, goats, deer, elk and bear. During that time, a perceived change in public attitude towards the well being of the animal has been observed, where greater efforts to save the animal are preferred over euthanasia. Horses in particular are no longer considered just livestock, but are increasingly becoming companion animals or pets, and most owners consider them nothing less than members of the family (Gimenez, 2003a). A survey by the Humane Society of the United States found that 89% of pet owners would risk their life to rescue their pet in an emergency. The actions of civilians evacuating horses and lamas during the local 8,900 acre Picnic Rock fire support this assertion, as well as media reports of civilian actions during recent grass fires in Loveland, CO (Martin, 2006).

Not only is there the emotional attachment to animals to consider, but there is an economic value as well. Horses' value starts at one thousand dollars, and only goes up from there. Many local horses are valued in the tens of thousands of dollars. With advances in veterinary medicine and the Colorado State University School of Veterinary Medicine (CSU VTH) in the community, many animals have a viable chance of surviving injuries that previously were not possible. For example Dr. Rodeheaver, DVM reported Kentucky Derby winner Barbaro, valued over one million dollars, was saved from a life threatening injury during the Preakness using surgery techniques developed in the last several years (personal communication, May 20, 2006). Larimer County has an estimated 10,000 head of livestock. Larimer also has the second highest county population of horses in Colorado, and is experiencing a steady growth in the equine

industry (Larimer County Land Use public meeting, April, 2006). Large animal economics are not limited to horses however.

Local dairyman Ken Stegner lost eight dairy cows when his dairy barn collapsed under the weight of snow in the spring of 2003. According to Stegner, each cow was valued at $2,700. Coupled with an additional loss of milk production from these cows, an economic loss of $53,000 was experienced (personal communication, May 12, 2006). When a cattle truck overturned on US Highway 287, PFA and LFPD fire officers had to euthanized 14 injured cattle to gain access to several dozen more that were trapped, uninjured, in the wreckage. Ultimately 23 of the 89 cattle perished resulting in an animal loss of over $14,000.

Other incidents the author has responded to include horses and cattle loose on county roads and highways, some which resulted in severe vehicle wrecks; horses and cattle stuck in mud, cattle guards, and barbed wire fencing; horses entrapped in barn fires and by grass fires; and horses and cattle involved in trailer accidents. Vehicle accidents with wildlife and nuisance bear removal have also been prevalent.

Fire Departments, EMS, and Law Enforcement personnel are trained to respond effectively to any emergency involving people. Regardless of their equipment, most responders do not have the training to rescue large animals from similar situations safely (Gimenez, 2003 b). This assertion holds true within PFA and LFPD as well. Only a few firefighters have personal knowledge to effect a successful rescue with large animals. No formal department training, operational directives, or dedicated rescue equipment exists to handle these types of emergencies. Additionally, there are no cooperative relationships that are currently established with local veterinarians or the CSU VTH.

The author has chosen this research topic because of its relation to the National Fire Academy's Executive Fire Officer Program course Executive Leadership. In Unit 7: Succession/Replacement Planning- succession planning is a critical element of organizational strategy. The need for PFA to formally inculcate the ability to safely and successfully rescue large animals exists before fire officers with this experience and interest attrition out of line operations. This research project also relates to the United States Fire Administration operational objective of responding appropriately in a timely manner to emerging issues. By providing an appropriate level of knowledge, training and equipment to firefighters who must rescue a large animal, both firefighter safety and the public's safety are enhanced; and the mission of PFA to protect lives and property is expanded.

Literature Review

A literature review was initiated at the National Emergency Training Center's Learning Resource Center. Additional research was conducted through the Internet, CSU VTH library, and personal interviews. The purpose of this literature review is to discover how others have effectively mitigated large animal technical rescues. Three basic questions must be addressed: What type of emergencies involving large animals have firefighters responded to? How have other fire service jurisdictions effectively handled large animal rescue incidents? Lastly, what training, equipment, operational directives or other needs must be provided to firefighters to safely and successfully mitigate large animal emergencies?

Gimenez (2003a) asserts an animal emergency is a human emergency where the old cliché "We don't do animals" is not an option. While the effects of hurricane Katrina

on the animal population were widely publicized, every day emergencies involving one or a few animals are more common, but often go unreported. Gimenez states that there is no database currently available that tracks the frequency of large-animal incidents. However trailer accidents, barn fires, escaped animals onto the highway, and animals caught in mud or broken through ice are all events emergency responders have been called to. These types of incidents are widely reported by other veterinarians and fire service members as well (Barakat, 2006; Becker, 2003; FSI, 2002).

The concept TLAER is a relatively new field in the American fire service. Captain John Fox of Felton Fire Protection District in California began to research the concept in the late 1990's. He found TLAER training in the United States fire service consisted of isolated and fragmented efforts (Fox, 2006). His research did show that world wide, countries such as Sweden, Finland and England provided large animal rescue as part of a standard service level. Hampshire, England responds to an average of five calls a week, and incorporates TLAER as a component of the basic firefighter academy. Sumerset England Rural Fire Brigade deals with approximately 500 animal related incidents a year, and continues to improve their large animal rescue program by developing new equipment (Newland, 2000). Using information discovered from international research, Captain Fox, working with his wife and equine veterinarians, developed the first fire service TLAER program in the United States, which received California State Fire Training certification in 2002 (Fox, 2006).

While there are few formal TLAER training programs in the fire service, there are excellent programs available from the equine veterinary community. Tomas and Rebecca Gimenez from Clemson University in South Carolina, Nathan Slovis from Haygard

Equine Medical Institute in Lexington, Kentucky, and John Madigan from the University of California- Davis, are four veterinarians who have pioneered the field of TLAER. Both Gimenez and Madigan realize the importance of working with emergency service providers, creating a team approach with veterinarians. As John Madigan, DVM states- "You just can't swoop in unannounced and save the day. You have to work within the system and do it before there is a disaster." (Barakat, 2006, p. 49).

> Attending veterinarians should be aware that they are on the scene as part of a team- first to assess and possibly stabilize the medical condition of the horse, and second to assist as a team member in the selection of the most appropriate rescue procedure. In many cases, the veterinarian may be neither in charge of the rescue operation nor the operational rescuer.
>
> Tomas Gimenez (Gimenezs, Baker, & Johannessen, 2002 p. 277).

Gimenez further asserts that for the horse to have the best chance of survival, the people who reach the scene first have to be informed on how to care for the horse. If firefighters don't make an effort to save the horse, the owners will, and that can be very dangerous. Nathan Slovis, DVM from Haygard Equine Medical Institute was so impressed with the Gimenez training, Haygard began hosting regular training sessions free of cost for firefighters in central Kentucky. After receiving the training, Chief Bob Hendricks of Lexington felt the program fit the department's mission statement by meeting a loss prevention priority in the community. Slovis strongly advocated that horse owners approach their local fire service and encourage TLAER training by documenting the need and providing support for the effort (Barakat, 2006).

These veterinarians all agree the first premise is “Do no harm.” Iatrogenic injuries are often caused by untrained rescuers using the animals head/neck, legs, or tail as handles, or other techniques that would never be used on humans (Gimenezs, Baker, & Johannessen, 2002). Human standards of care are often disregarded when the rescue involves animals. (Gimenez, 2003a). Of paramount importance is the safety of the emergency responder and public. Untrained rescuers often get hurt. A risk analysis of the situation and capabilities of the rescuers must be considered. Large animals can be extremely dangerous and expose rescuers to physical and biological hazards. Most large animals are flight animals and the risks of being crushed, impaled, struck, or trodden upon are very real. Animals also may transmit over a dozen zoonotic diseases (FSI, 2002).

After witnessing a horse fall to its death from an attempted helicopter rescue, Madigan worked extensively to develop a sling and techniques for successful helicopter rescue of horses (Madigan, Galuppo, Sullivan, Morgan, 1993). Gimenez has developed a complete TLAER training program for first responders and veterinarians that covers the basics of animal handling, horizontal drags, rescue glides, vertical lifts, extrication, and the use of special slings (Gimenez, 2003 a,b,c,d,nd-a&b). Fox, through the California State Training office and the British Fire Service have developed similar training targeted specifically for the fire service (CDF, 2002; FSI, 2002). The majority of the information shared in these programs pertains to horses, although rescue techniques are applicable to cattle and other large animals as well. However cattle are different when attempting to move them into a place of safety. Specific techniques must be used in herding cattle for a successful outcome (Sprinkle, 2000).

All of this information is available to the fire service in the form of seminar training. Gimenez teaches a three day class that includes live animals as working props where firefighters can attend pre-scheduled courses, or the program can be taught locally (Gimenez, Baker, & Johannessen, 2002). The Large Animal Rescue program taught by Fox is limited to firefighter attendance in California (CDF, 2002).

Additional firefighter and public training involves the aspect of animal management during natural disasters. While winter storms and floods have occurred locally, wildfires are the most prevalent of large scale incidents. Prior planning is essential when evacuation may be considered. Unless people evacuate well ahead of the fire with their animals, evacuation is too dangerous at the last minute. Prevention, mitigation, and proper planning will be the greatest contributors to a successful outcome where wildfire and animals interface (AAEP, 2003; Lindroth, 2005).

The incident command team is well advised to consider the needs of people and their animals during an incident. Directions to take animals when evacuating, and where shelters have been established that accept animals, should be given (Cook, 2001). If shelter-in place strategies are used, information should be given to relocate livestock to dirt paddocks and mown grass areas with steel fence and appropriate water. There may be a need to have veterinary assistance available as part of the incident. Veterinarians should be integrated into the emergency management plan before the incident so that details concerning incorporation into the command system and financial reimbursement can be worked out (Heath, 1999). No literature on wildlife rescue/intervention was located other than wildlife handling in a zoo.

Equipment required in TLAER is relatively standard through all training programs. It includes rope rescue equipment, specialized slings, a "backboard" designed for large animals called a rescue glide, and equipment routinely found on a fire engine (Becker, 2006; CDF, 2002; Gimenez, Baker, & Johannessen, 2002).

Procedures

To seek an answer to research question one "What type of emergencies involving large animals have local firefighters responded to?" officers of Poudre Fire Authority and Livermore Fire Protection District members were surveyed through electronic mail and asked to answer the above question with a general description of the incident. Officers who responded to the questionnaire were then contacted and interviewed for further information on the incident. To further understand the response other local fire agencies have employed for large animal incidents, Chief Ned Sparks of neighboring Loveland Fire Rescue (970-962-2471), Administrative Clerk Lisa Betcher of neighboring Wellington Fire Protection District (970-568-3232), and Dave Mosure of Larimer County Emergency Services were contacted and interviewed with the same question in May of 2006. Each agency's National Fire Incident Reporting System (NFIRS) records were queried for animal incident call type 540, 541, and 542 covering a time span of the last ten years. Records received were sorted as to animal type, with all small animal incident records removed. To gain further insight into the extent of the local problem, several interviews with Dr. Racquel Rodeheaver (970-420-1601 were conducted in March and April of 2006 requesting the same information. Dr. Rodeheaver is an internationally experienced equine practitioner with interests in TLAER. Her experience includes

working with renowned equine hospitals Rood & Riddle and Littleton Large Animal, and CSU VTH as an equine ambulatory field service veterinarian.

To seek an answer to research question two "How have other fire service jurisdictions effectively handled large animal rescue incidents?" and research question three, "What training, equipment, operational directives or other needs must be provided to PFA firefighters to safely and successfully mitigate large animal emergencies?" a search in the National Fire Academy's Learning Resource Center was done in December of 2005. Key search words and phrases included "animal rescue", "technical rescue", and "large animal technical rescue". An additional internet "Google" search was performed in January of 2006 using the same search words and phrases. Departments and agencies that were identified as having large animal rescue programs were then contacted and interviewed. Dr. John Madigan of UC Davis School of Veterinary Medicine <jmadigan@ucdavis.edu>, Dr. Tomas Gimenez of Clemson University <tgmnz@clemson.edu>, and Captain John Fox of Felton Fire Protection District, CA <jdfox@got.net> provided information via the internet or personal interview. Captain Tony Brownell of Chico Fire Department, CA provided a California Department of Forestry and Fire Protection – Large Animal Rescue student manual, and firefighter Nancy Roberts of PFA provided a student manual from Technical Large Animal Emergency Rescue. Additional literature was obtained from the Veterinary School of Medicine library at Colorado State University. To gain further insight into the extent of large animal issues, the author attended the 1st Annual Rocky Mountain Regional Conference on Biodefense and Emergency Animal Rescue sponsored by Colorado State

University and the Colorado Veterinary Medical Foundation held in Ft. Collins, CO March 18-19, 2006.

The synthesis of information obtained from these sources provided the basis for program recommendations to develop a Technical Large Animal Emergency Rescue team.

Limitations and Assumptions

The fire service is called to a wide array of animal assistance incidents. The vast majority of these incidents deal with small animals, which is not germane to the research of this paper. The Colorado Division of Wildlife (DOW) is the lead agency when dealing with wildlife issues. Firefighters provide DOW assistance with equipment and manpower, and are under the direction of a DOW officer. Incidents pertaining to wildlife are also not covered in this research.

Another area of growing concern throughout the nation deals with the evacuation and sheltering of small and large animals during catastrophic emergencies such as hurricane Katrina. While the importance of having knowledge on how to assist large animals during structure and wildland fires is covered in this research, the topic of animal evacuation and sheltering is a separate topic to be addressed at a later date.

Definition of Terms

Technical Large Animal Emergency Rescue- consists of removing a large animal from a hazardous environment without causing harm to the victim or the rescuers.

Iatrogenic Injuries- Injuries sustained by the victim due to inappropriate rescue techniques or treatment.

Zoonoses- Diseases carried by animals that are transmissible to humans.

Results

The results of question one found that local firefighters respond to a variety of emergencies that involve large animals. Data as to numbers of incident responses to specific types of rescues was limited, as well as the outcome or success of the incident, and whether or not a veterinarian assisted. The following is a list of incident types responded to in the last ten years by fire service agencies in Larimer County, Colorado. Incidents marked by an * involve multiple incidents on different occasions. Colorado Division of Wildlife was the lead agency where nuisance bears were removed.

1. Horse mired in mud.*
2. Horse down on ice.
3. Horse down, requires assistance in getting up*
4. Horse caught in wire fencing.*
5. Horse caught in railroad trestle.
6. Horse caught in bridge.
7. Horse caught in cattle guard.*
8. Horse ran through plate glass window of restaurant.
9. Horses in collapsed barn.
10. Horse loose on highway.*
11. Horse / vehicle collision.*
12. Horse trapped in trailer – vehicle accident.*
13. Horse trapped in barn fire.
14. Horse trapped by wildfire.*
15. Lammas trapped by wildfire.

16. Cow mired in mud.*
17. Cow caught in wire fencing.*
18. Cattle loose on highway.*
19. Cow / vehicle collision.*
20. Cattle caught in trailer – vehicle accident.
21. Cattle caught in collapsed steel building.
22. Deer / Elk / vehicle collision.*
23. Bear removal from tree.*

The results of question two have identified there are no specific TLAER programs in any fire service agency in Larimer County. Only one private organization- Code 3 Associates of Longmont, Colorado, and no fire service based programs were identified on the Northern Colorado Front Range. In all incidents where the fire service responded to assist a large animal, firefighters relied on their best judgment to mitigate the situation.

A presentation by Code 3 Associates at the 1st Annual Rocky Mountain Regional Conference on Biodefense and Emergency Animal Rescue indicated that their training and emergency services were available for large and small animals, that they were equipped for dual roles of rescue and evacuation, and that their program was primarily staffed with volunteers.

The results of question three have identified the need for the following concerns to be addressed.

Operational Directives- No operational directives currently exist for PFA, LFPD, or Poudre Emergency Communications Center concerning large animal incidents. A citizen's call to 911 may garner a response of "Contact Animal Control" (who does not

deal with large animal rescues). If the caller is persistent or the dispatcher sympathetic, the closest engine company would be dispatched for a public assist. An operational directive for large animal incidents is included in Appendix A. A dispatch protocol for large animal incidents is included in Appendix B.

Training- Training in TLAER includes the following topics:

- Risk analysis and size-up*
- Proper use of appropriate personal protective equipment*
- Understanding of physical and zoonotic hazards*
- Roles within the Incident Command System*
- Proper execution of protocols between the rescuers and attending veterinarian
- Knowledge of large animal handling skills*
- Knowledge of large animal behavior under stress*
- Animal first aid*
- Rescue techniques that minimize soft tissue injury
- Simple vertical lift, forward assist and backwards drag techniques
- Basic technical rope rescue
- Mud rescue
- Water rescue
- Transport of a downed horse
- Trailer accidents and extrication
- Barn fire rescue*
- Evacuation coordination*
- Shelter in place strategies*

- Herding and holding techniques*
- Helicopter operations
- When to euthanize*

All firefighters need to be aware of some basic information about large animals so that firefighter and public safety is maintained, and that the animal is not further injured by well meaning but inappropriate actions. An introductory/awareness training program developed for PFA and LFPD firefighters covering subjects marked with an asterisk is included in Appendix D.

Training firefighters in TLAER, a technician level, would entail either sending the firefighters to an out-of state seminar, sending several firefighters to a "train the trainer" program, or hosting a seminar in Fort Collins. Attending a three day LAERT seminar taught by Gimenez would cost approximately:

- Tuition $385
- Travel $400
- Per Diem $230
- Lodging $400
- Total $1,415 per fire fighter

Attending a two day large animal rescue training taught by Fox would cost approximately:

- Tuition $165
- Travel $400
- Perdiem $168
- Lodging $300

- Total $1,038 per firefighter

A “train the trainer” course by Fox would entail attending two courses; one as a student and one as an apprentice instructor. This would be an investment of approximately $2,100 per trainer.

Hosting a three day seminar by Gimenez in Fort Collins would cost:

- Instructors fees $11,000
- Course location – PFA training center – N.C.
- Total $11,000

Instructors’ fees could be reduced if several courses were taught by the instructor while on circuit. With a limit of 30 students per class, $350 per student tuition would be required.

Equipment- Many basic rescues can be performed with equipment routinely available on fire apparatus. This would include personal protective equipment (PPE), low angle rope rescue equipment, medical supplies for first-aid, and fire hose. However specific equipment is required to perform more advanced vertical, dorsal and lateral recumbent lifts, technical rescues, or transportation of the injured animal. A complete list of recommended rescue equipment and associated costs, beyond standard engine company equipment, is available in Appendix C.

Other needs- A funding source is the primary need that must be met to successfully institute this program. Capital equipment acquisition and training 12 personnel will be approximately $7,500 , which is not available in the 2006 PFA budget. Due to shortfalls in the City of Ft. Collins tax revenue, the 2007 PFA budget may require up to an 8 % cut in funding. Because of this, one time grant funding or donations for the program may be

the best option to get it started. PFA operations and maintenance funds could be provided for continuing the program.

Potential sources of grant funding include CSU VTH, Anheuser-Bush Brewery, the Striker foundation, the Larimer County Horsemen's Association, Colorado Office of Emergency Management FEMA Grants, and private donations from local horse enthusiasts.

Discussion

The type of large animal incidents PFA, LFPD, and surrounding fire services respond to are very similar in scope to those identified in the literature review. Local firefighters have experienced both horses and cattle entangled in wire fences; entrapped in cattle guards, bridges and collapsed structures; mired in mud; down on ice; involved in trailer accidents; evacuated from fire situations; or loose on roadways. All of these situations were identified as emergency response types by experts in the field of large animal rescue (Barakat, 2006; Fox, n.d.; Gimenez, n.d. a&b; Madigan et al, 1993). In fact, only three incident types were not experienced; a horse in a swimming pool, a horse fallen into a septic tank, and a rescue involving the use of a helicopter. This author found it surprising the number and variety of incidents of this type that have been encountered locally, because there is very little organizational awareness of the problem. NFIRS data did not accurately reflect the numbers and types of incidents. Quite often calls were documented as a public assist, a vehicle accident, extrication, or a fire; where the only reference to an animal, if any, was mentioned in the report narrative.

While in each case the incident was resolved, in many of the situations iatrogenic injuries occurred, or the animal was euthanized without veterinarian consult. In an

overturned two horse trailer accident, one horse drowned while the other was pulled out over the top of it. In the collapsed dairy barn, wounded and trapped cows were pulled by the neck from the wreckage using a tow chain and tractor. In a horse trapped in mud situation, a 3-1 mechanical rope system was used to pull the horses halter. In a similar situation with a cow down in the mud, a tow truck was used and attachment points were her appendages. Over a dozen wounded cattle were euthanized by fire officers in an overturned cattle truck utilizing a law enforcement officer's shotgun. While this may have been the best immediate option given the fire officers cattle ranching background, there was no veterinary or owner consultation. All of these incidents would have been handled more professionally with skills taught in TLAER programs (CDF, 2002; Gimenez, n.d.) Additionally, liability issues are of great concern when operating outside of industry best practices, training, protocol, or without direct written consent of owner.

Evidence exists that fire agencies throughout the United States are gaining quality training from various experts in the field of TLAER (Barakat, 2006, Fox, n.d.). Since the number of training programs is relatively small, and the field of TLAER training relatively new; fire agencies are either not responding to this type of incident, responding and operating with no training, or operating within the framework of one of several educational programs. Local fire departments would fit into the second category.

An effective program can be developed for PFA and LFPD to successfully intervene in large animal incidents. Much of the program development for operations level training and equipment exists from other jurisdictions. From an extensive literature review, the author believes the nation's foremost experts in TLAER training are Drs Tomas and Rebecca Gimenez on the east coast and Captain John Fox of Felton Fire

Protection on the west coast (Fox, nd). The Gimenezs travel throughout much of the United States delivering their program. Fox primarily teaches in California.

A local private organization, Code 3 Associates of Longmont, CO, offers disaster response and training in the field of animal rescue and evacuation. From reviewing course material, it is the author's opinion that the program would be less comprehensive than that available from Gimenez or CDF. However, Code 3 would be an excellent resource for large scale disasters where an evacuation and animal sheltering need exists.

The Large Animal Rescue program taught in California (CDF, 2002) is designed for rescuers to affect rescue with basic equipment found on an engine company. The course is a one day class, with an optional second day of field scenarios utilizing mannequins. There is no interaction with live animals. The most cost effective way of bringing this program to Ft. Collins would be sending two firefighters to the course to "train the trainer", then teach it locally. Given the importance of giving firefighters hands on skills with live animals, and the need to develop a working relationship with local veterinarians, the author believes this would be a less than ideal delivery method.

The best option for comprehensive training of a large number of individuals would be to host Gimenez for a three day program in 2007. The course basics would be taught in two days. The third day would be a session on helicopter rescue in conjunction with Geo-Seis Helicopters, Inc of Ft. Collins. Co-hosting the class with the Colorado Veterinary Foundation or CSU VTH, and opening the class to surrounding fire departments and local veterinarians, would foster an atmosphere of cooperation and bring together experts of both disciplines.

Equipment lists are included in many of the course program manuals (Becker, 2006; CDF, 2002; FSI, 2002; Gimenez, Baker, & Johannessen, 2002). A cache of recommended equipment could be made over several years, and agreements made with CSU VTH to use their Anderson Sling. Locating an appropriate trailer that would be available for emergency use is another consideration since most horse/stock trailers are not designed to transport a recumbent horse.

When deciding how the TLAER program should be implemented, consideration should be given to which station would be most suited for the program. The wildland fire specialty station has personnel that are well suited to operating in rural environs, and have four wheel drive apparatus equipped with winches, air compressors, and rope rescue equipment; all are useful items in TLAER (Gimenez, Baker, & Johannessen, 2002).

Having veterinarians respond as part of a team approach is critical to having a successful outcome in TLAER (Barakat, 2006). It is important to open dialog with local veterinarians to develop a system where veterinarians can be oriented to ICS and fire department operations, and firefighters can understand the needs of veterinarians when providing medical care to the animal. In the event that an animal sustains an injury that requires transport to CSU VTH for treatment and long term care, a transportation plan for a recumbent animal must be made. Under no circumstances should a person ever ride in a trailer with an animal.

For any fire department program to be successfully maintained over a span of years, it needs to be codified in policy. An operational directive that addresses the scope, provides guidance for strategic and tactical levels of rescue, identifies team structure and necessary affiliates, identifies where the program is based, and identifies the parameters

for mutual aid; must be written and approved by the operations team. A dispatch procedure for Poudre Emergency Communications Center must be written and programmed into Computer Aided Dispatch that covers all the relevant fields of information needing to be entered for the call (Fox, n. d.).

Recommendations

The following recommendations are made after researching the topic of Technical Large Animal Emergency Rescue:

1. Based on the findings of this research, a compelling need exists for all firefighters to receive awareness training in large animal incidents, and advanced training of TLAER for a select group of PFA and LFPD firefighters. For this to occur, chief officers need to be presented with the findings of this research, and organizational support gained to pursue program development.
2. The following implementation steps for PFA and LFPD should occur:
    - A two hour awareness course (Appendix D) should be taught to all PFA and LFPD firefighters.
    - Schedule a TLAER training program for 2007 with Dr. Gimenez.
    - Seek interested firefighters to establish TLAER team.
    - Support program with appropriate operational directives and policies.
    - Support program by obtaining appropriate equipment.
    - Base technical response out of Wildland Fire Specialty Station 7.
    - Seek outside financial support to offset training and equipment purchases.
    - Develop relationships and response protocols with local large animal veterinarians.

- Develop relationships with CSU VTH receiving facility.
- Promote program availability with news media, veterinarians, and animal owners.

3. The four primary benefits of establishing a TLAER program will be:
   - Increased firefighter and public safety.
   - Increased survivability of large animals.
   - Increased level of service to the public.
   - Reduce liability exposure.
4. Additional research is needed in tracking incident data of this call type. Accurate statistics from NFIRS data does not exist. Given the emergence of this new field, an accurate tracking of number, type, and time involved with the rescue would be appropriate.
5. Implementation of this program should be as stated above. To be of assistance to a greater number of people, the service of the TLAER team should be available on a mutual aid basis to all Larimer County fire departments and veterinarians.
6. A three year evaluation of the program should occur to assess the impacts of the new service on the department. If the response of the pubic is supportive of the program, every effort should be made to continue it. If the program is not viable, consideration should be given to passing it off to a private or quasi-private organization so that the public still has a resource to turn to.
7. It is important for other researchers seeking information on this topic to look outside of the fire service. It is the author's experience that veterinarians are not accustomed to working within ICS and a team environment, and often operate as an individual. The field of veterinary medicine has many extremely talented and gifted individuals

that should be sought as a resource when dealing with animals. Efforts should be made to open dialog based relationships with local veterinarians and then invite them to be part of a working fire service team. A team approach to TLAER enhances the well being of all involved.

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Appendix A

POUDRE FIRE AUTHORITY OPERATIONAL DIRECTIVES

Operational Directive: Large Animal Rescue

Purpose: To provide a safe, effective, consistent approach to emergency incidents involving large animals.

Scope: Poudre Fire Authority personnel respond to a wide variety of incidents involving large animals. All personnel will be familiar with and abide by the following directives.

1. It is the intent of Poudre Fire Authority to serve the citizens and visitors with Large Animal Rescue capabilities. Further, this service will be available to surrounding agencies through the request of Mutual Aid.
2. Incidents involving large animals can be dangerous to the animal, civilians, and emergency personnel. When the life of a civilian is at risk, the first due Engine Company will respond Code 3. Human life safety takes priority over animal life safety. Otherwise, a Code 2 response is appropriate.
3. All personnel will be taught safe practices through an awareness level training. Each shift will have a minimum of four personnel trained to the Technical Large Animal Emergency Rescue technician level, with at least one of these firefighters stationed at Station 7.
4. Station 7 will maintain a rescue equipment cache for the sole purpose of animal rescue, and will be dispatched as a supporting company on all animal rescues.
5. Appropriate PPE will be worn when working with large animals. At a minimum, this includes wildland helmet, boots, and gloves.

6. PFA firefighters will work in conjunction with the owner and a responding veterinarian for the benefit of the animal. PFA will be responsible for Incident Command and all aspects of the rescue. The veterinarian is the medical authority on scene and will be responsible for the medical care and treatment of the animal. Both are encouraged to develop an incident action plan and assist each other as necessary.
7. PFA is not liable for veterinary services rendered. The animal owner will be responsible for all veterinary cost incurred.
8. PFA will provide support to Colorado Division of Wildlife officers when requested for wild animal situations. All relevant protocols will apply.

Appendix B

DISPATCH PROCEEDURES

Incident Type: Large Animal Rescue

When a call for assistance with a large animal is received, the closest engine company will be dispatched and respond Code 2 unless there is a human life safety component. Upon receiving the call, the call taker will obtain the following information:

1. What is the nature of the emergency?
2. Are there any people injured? If so, follow EMD procedures as well.
3. Where is the location of the emergency?
4. What type and how many animals are involved?
5. Are there any animal injuries?
6. Is the owner present? If not, how can they be contacted?
7. Has a veterinarian been called? If so, what is their response time?
8. If no veterinarian has been called, call a veterinarian from the pre-established veterinarian response list. Provide the veterinarian with scene information, obtain the veterinarians cell phone number, and ask for an estimated response time.
9. If a vehicle accident, notify appropriate law enforcement.
10. If wildlife is involved, notify Colorado Division of Wildlife or the Colorado State Patrol.

Appendix C: TLAER Equipment List

Basic Rescue Equipment

3- Rope halters with detachable cotton lead ropes	$60
2- Horse head protection	$400
4- 35’ ½” kernmantle rope	in stock
1- 30’x4” nylon web with loops on ends	$300
1- Set fleece lined hobbles	$40
6- 6’ Prussik loops of ½” static rope	in stock
12- Large steel carabineers	$262
1- J hook	$35
1 Simple vertical lift sling system	$996
1- Nikopolous needle	in stock
1- Low angle rope rescue kit	in stock
4- Roll 4’x 50’ polygrid containment fence	$100
8- 6’ Tee posts	$32
1- Tee post driver	$30
1- Package 12” nylon zip ties	$10
1- Rescue Glide and support kit	$995
Total cost for basic program	$3,260