



The Origin and Evolution of Search and Rescue Dogs in California

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The Origin and Evolution of Search and Rescue Dogs in California

Tim Houweling

A Thesis in the Field of History
for the Degree of Master of Liberal Arts in Extension Studies

Harvard University

May 2025

Abstract

Search Dogs have been working in California for just over 50 years. They capture the attention and hearts of the public and the media when they respond to help find victims of calamity. And there have been a lot of calamities.

There is no doubt America loves her dogs. While there have been plenty of books that describe individual teams and their exploits in search and rescue, there is very little written work that captures the history and evolution of this profession. Our history is an oral one – passed down from handler to handler, generation to generation. Some is accurate, some is embellished, and some is downright wrong. This research is a labor of love into a profession I have poured my heart and soul into. It deserves to have its founders and innovators highlighted, and a common historical reference established. But mostly, it's to honor the dogs who are not volunteers, but still willingly go to places most humans fear to tread. They are our partners, our friends, our soulmates, and sometimes our last hope of being found.

Frontispiece



Human Remains Detection Canine Georgie rests on top of his handler Tim Houweling to stay warm after day 6 of searching in the Camp Fire city in the city of Magalia. Note three of Georgie's four paws are bandaged after working in difficult conditions.

Photo credit: Katie Roberts

Author's Biographical Sketch

I began my career with search and rescue dogs in 2005 with the California Rescue Dog Association. I have certified six dogs: Deuce, Tater, Georgie, Charley, Carl and Rory. I am a Canine Search Specialist with FEMA California Task Force 3, an Urban Search & Rescue team. I've certified wilderness dogs, disaster dogs, and cadaver dogs. I've served on the Board of Directors of the largest search dog organization in California (CARDA), which has the most search dogs in the United States. I am a FEMA Evaluator and FEMA instructor. I also serve as the Canine Coordinator for FEMA California Task Force 3. I founded a non-profit, HD Search Dog Fund, Inc., that provides training and gear to our nation's search and rescue dogs. I also serve on the Board of Directors of First Responder Therapy Dogs, Inc.

I have been a professional dog trainer since 2004 and previously helped run a non-profit that provides service dogs to children with autism and to veterans.

I am a Fire Captain in the San Francisco Bay Area and am passionate about improving first responder mental health. I founded a non-profit with my wife, who is a retired Firefighter, that helps first responders access sacred medicine served by indigenous people (www.thesirenproject.org). These medicines have proven more effective than western medicines in treating post-traumatic stress injury (PTSI.)

Prior my life going to the dogs, I worked as an investment banker on Wall Street and am a certified public accountant. My family and I live in Carmel Valley, California.

Dedication

This work is dedicated to the dogs. They have changed my life in more ways than I can list. With a look, a lick or a lean, they make the tough days easier.

This work is dedicated to the volunteer search dog handler – the one who volunteers their time and puts themselves and their partner in harm’s way to help a stranger; the one who answers the call in the middle of the night; the one who fills their gas tank with no expectation of reimbursement. They leave their loved ones safe and warm at home not for glory, not for money, and certainly not for fame. They represent the best spirit of humanity.

This work is dedicated to my mentors, without whom I probably would have given up innumerable times. People like (in no particular order) Shirley Hammond, Bob Macaulay, Bryan Selby, Wayne Behrens, Shay Cook, Donn Yarnall, Elise Lalor, Michael St. John, Jerry Weidler and Michael Ellis to name a few.

This work is dedicated to the early handlers who had the audacity to think they could train another species reliably enough to be the best detection method we have, including Bill Syrotuck, Sandy Bryson, Bill Dotson, Willy Grundherr, Bev Peabody, Jan Brennan and others.

This work is dedicated to those who advocated, and continue to advocate for expanding the role of search dogs. This includes such influential people such as the former Director of the California Office of Emergency Services Mark Ghilarducci, Chief Larry Collins, Chief Harold Schapelhouman, Chief John Wurdinger, and Dr. Ben Ho.

This work is dedicated to my canine partners. Deuce, Tater, Georgie, Charley, Carl, and Rory. You have taught me the most about how to be a good human. I wish I could go back and apologize to each of them for not being the trainer and partner they deserved while I was learning.

Finally, this is dedicated to my family. To my mom and dad who brought home my first dog Titan, because they thought a 12-year-old boy needed a dog. To Angela and AJ, who tolerate absences, distraction, and fur on every surface in the house to allow me to pursue my passion. The time to research and write this paper is precious time away from an eight-year-old boy. Without their support and encouragement, this story would have remained untold.

Acknowledgments

I would like to express my heartfelt gratitude to my research director, Dr. Ostrowski, whose guidance and expertise were invaluable throughout this journey. A shared love of dogs and your guidance has made a significant impact on my academic growth.

I would also like to extend my sincere appreciation to my research advisor, Dr. Miner. Thank you for directing me to a wonderful research director, and I am grateful for your patience and the confidence you instilled in me.

The collaborative spirit fostered by both Dr. Ostrowski and Dr. Miner has created a dynamic and inspiring atmosphere that motivated me to strive for excellence. It has been a privilege to learn from such esteemed scholars who are truly passionate about their work.

Finally, I would like to acknowledge the supportive community within the Harvard Extension School. The shared knowledge and camaraderie have enriched my experience, making the process of conducting research both enjoyable and rewarding. Thank you, Dr. Ostrowski and Dr. Miner, for your unwavering encouragement and for believing in my potential.

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Chapter I.

Cold Days

We stood in line with our parkas closed tight around our faces. It was in the low forties but the rain made it feel colder. The turkey cooked by the convict crew sat on our plates covered by mashed potatoes and gravy. Peas, corn and bread rolls rounded out the meal. Nobody passed on the pumpkin and pecan pies. We shuffled to the drink station, where we chose between water, milk, or Gatorade. The dozens of picnic tables were arranged under the heat lamps that could not quite overcome the damp cold. We sat with our teams, mostly by specialty, trying to make the best of it. Behind us sat firefighters from Orange County. In front of us were volunteer canine teams who knew each other from years of training together, though normally they saw each other in twos and threes and not dozens. Two weeks earlier our thanksgiving plans had been very different. But for the survivors of Paradise, Concow, and Magalia, Thanksgiving now had a much deeper meaning.

When we had arrived a few days earlier, we had been told 15,000 structures had burned and 1,500 people had been reported missing. Dozens of canine search teams wearing a variety of colors and patches responded to help locate them. The canine teams were being asked to find a scent few had trained for in an environment that was impossible to train for.

Forty-six years earlier, on Thursday March 2, 1972, Terry Neumann was skiing with his friends. He died at Heavenly ski resort on the south shore of Lake Tahoe after

being caught in an avalanche on the face of the mountain. His friends escaped. No search and rescue dogs existed in California at the time, though the need for them was known. His body was found nine weeks later. If local canine teams were available, could he have been saved? Could he have been found sooner? This event helped hasten the creation, training, and development of search dogs in the state. Since the start, the evolution of search and rescue dogs has been driven by critical events at different times.

“The body of Terry Wilson Neumann, 28, buried in a snow avalanche at Heavenly Valley, March 2, was discovered Saturday by a search team. An expert skier, Neumann had been racing down the north slope east of the tram at Heavenly Valley with four other skiers when he was trapped in an avalanche. The other skiers escaped when the avalanche broke loose in three slides. The search for Neumann, who resided at State Line and was a ski instructor at Heavenly Valley for two years, had continued daily for nine weeks. Searchers had checked the area three times a day and on Saturday they noted evidence of a coyote digging in the area. They dug further into the snow where they discovered Neumann’s body.”¹

I was born ten days after that avalanche, though I needed to be lost in the world for a while before finding myself in the search dog universe. Over the course of my lifetime, canine search and rescue has evolved to an increasingly specialized discipline. One thing has not changed – handlers and dogs are still being asked to perform outside and above their training on a regular basis. While there is plenty out there to read about how to train a search dog, there is little about how the profession began or evolved in California.

¹ Staff Writer, “Missing Skier’s Body Found by Searcher,” *Lodi News-Sentinel* (Lodi, CA), May 3, 1974.

Chapter II.

Tribal Histories

New handlers in the search dog world are told various versions of the founding of this profession. The version one learns is based on variations in geography, membership in one of several “tribes,” and the search discipline within which one is working. As a new member to my tribe, the lore was passed verbally that members of “our” tribe such as Hatch and Judy Graham, Willy Grundherr, Bill Dotson, Shirley Hammond, and the Peabodys created our tribe to be the largest, most prolific group in the state to search for missing people in the wilderness. Other groups were described as quirky, weird, egotistic, unfriendly, or downright cantankerous. An oral tradition is a group’s shared history that forms its identity. There is a tribal feel amongst groups, and if you are a member of a different tribe, your version of history may be quite different.

I began this process with my own indoctrinated ideas of what the evolution of search dogs in California has been. I now know it was much more than and much different from what I had been led to believe. This thesis sets out to document the origin and evolution of the search and rescue dog in California as best as possible.

My research relies heavily on interviews with human subjects, which, by its nature is subject to the human memories of events that occurred 50 years ago in some cases, and therefore is fallible in its accuracy. However, given the paucity of records that survive to this day, I will use my best effort to ensure its accuracy. But like all studies in history, it is impossible to get to an underlying defining truth or fact. As Louise Comfort wrote: “Memory constitutes the vital record of those events and experiences ‘selected’ as critical to performance. These, then serve as the lessons learned from the interaction.

Several types of experience were vividly embedded in the collective memory of the human participants in search and rescue operations.”² If there are areas where we find discrepancies in dates, times, or participants, I ask forgiveness on behalf of myself and those who relayed these stories to me.

² Louise Comfort, *International Disaster Assistance in the Mexico City Earthquake, Quick Response Research Report #03*, Natural Hazards Research and Application Information Center, University of Colorado, Boulder, 1986, 17.

Chapter III.

European Roots

Search and Rescue dogs were not an American invention. Dogs have been used for their keen scenting ability for hundreds of years, doing a variety of jobs. “Ever since the first ewe was engulfed in an avalanche that swooped down some long-ago alpine pasture and the shepherd’s dog dug her out, working dogs have been displaying natural talents for detecting and locating the source of airborne and track scent from people, animals, and objects,”³ says Sandy Bryson in her book *Search Dog Training*.

Some of the most well-known search dogs were the venerable St. Bernards used in the Swiss Alps. According to the United Kingdom’s National Search and Rescue Dog Association in their online story *History of Search Dogs*: “The forerunners of modern search dogs are popularly considered to be the dogs of the Monastery at the summit of the Great St Bernard Pass. In the year 980, Bernard of Menthon built this Monastery and an Inn, as a refuge for travelers across the Pass.”⁴ As the lore has it, the monks of the monastery often had to help trapped, stranded, or buried travelers traversing the pass. They began to bring their dogs, originally there to guard the monastery, and the dogs would assist in locating the missing. This breed of dogs became known as the Saint Bernard. In fact, when discussing search dogs today, people often picture the grand Saint Bernard with a barrel of whiskey under its neck. Barry, the most famous of the Saint

³ Sandy Bryson, *Search Dog Training* (Pacific Grove, CA: Boxwood Press, 1984), 4.

⁴ National Search and Rescue Dog Association, *History of Search Dogs*. <https://nsarda.org.uk/search-dogs/history-of-search-dogs/>.

Bernards, was taxidermized after death and is still on display in the Natural History Museum of Bern.

However, there is no direct lineage between the noble Saint Bernard and modern search dogs. The modern search dog has its roots in the Red Cross dogs that would help locate the wounded and injured on the battlefield. “The development of modern search and rescue dogs occurred at the end of the nineteenth century,”⁵ writes Resi Gerritsen and Ruud Hawk.

According to the *History of Search Dogs*: “Whilst the St. Bernards were probably the first dogs used in mountain rescue, they were not an influencing factor in the formation of search and rescue dogs as they are known today.”⁶ Rather, the lineage of search and rescue dogs is traced through their use in wartime. “The German Association for Red Cross Dogs was established in 1890, and the first edition of the *Manual for the Training and Use of the Sanitätshunde* (translation: Medical Dog), written by Major A. Berdez of the Swiss Army, was published in 1903.”⁷ This training was brought to use in the first world war, when the dog’s keen sense of smell could detect the injured and wounded on the battle field. The dogs alerted soldiers and nurses to their presence, so they could be retrieved and treated.

After the first World War, the use of Red Cross Dogs diminished. During World War II, dogs were not used extensively in this capacity on the battlefield. Gerritson and Hawk tell us: “In World War II, the work of the Red Cross dog was taken over by

⁵ Resi Gerritsen, and Ruud Hawk, *K9 Search and Rescue, A Manual for Training the Natural Way*. (Canada: Brush Education. 1999), 9.

⁶ National Search and Rescue Dog Association, *History of Search Dogs*.

⁷ Gerritsen and Hawk, *K9 Search and Rescue*, 10.

soldiers and red cross volunteers, who could, during an agreed upon ceasefire, pick up the wounded and take care of them.”⁸

However, that does not mean search dogs did not play an important part in the war. Rather than search for wounded soldier on the battlefield, dogs were used to search for wounded civilians in England. German bombing of allied towns created situations where civilians would be trapped under rubble. According to Gerritsen and Hawk: “It was especially the German Shepherds of Mrs. Grifinn’s Crumstone Kennel that were the most capable in this work. Many of these dogs, such as Crumstone Irma and Crumstone Psyche, became famous because of their courage and perseverance in searching for victims beneath the rubble.”⁹ Irma and Psyche reportedly found 223 people, twenty-one of them living, during the war. Other notable canines working at the time were German Shepherd Rex, Beauty, a Fox Terrier, and Rip, a mixed Breed.

With these public successes, dogs became recognized for their ability to sniff out survivors and victims in rubble. The Swiss recognized this, and continued to advance the profession. Continuing from the UK’s *History of Search Dogs*:

“After the war, the Swiss Alpine Club, reviewed its normal method for finding the victims of avalanches, which involves a system of inserting a rod into the snow in the hope of feeling it strike a body. This ‘probing’ is done by a strictly disciplined line-out of personnel inserting the probes at pre-determined intervals. It is a very slow method and whilst being very thorough gives a very limited chance of finding the victim alive. They considered the previous success of dogs in the rescue role, and decided to train dogs for avalanche work for their own rescue network. This met with continued success and avalanche dog training centres have become widespread throughout the Alps.”¹⁰

⁸ Gerritsen and Hawk, *K9 Search and Rescue*, 12.

⁹ Gerritsen and Hawk, *K9 Search and Rescue*, 13.

¹⁰ National Search and Rescue Dog Association, *History of Search Dogs*.

Sandy Bryson writes “After World War II, in the mountain hamlets of Switzerland, Austria, and France, where hundreds of lives were threatened each winter by roaring snow avalanches, German Shepherd dogs, who had proved their mettle doing scent work under battle conditions, began training for peacetime duty as specialized avalanche dogs.”¹¹

The Swiss have been leaders in search and rescue dog training since. “Because there was little written of earlier experiences with the use of search and rescue dogs, Urs Ochsenbein in Switzerland started in the early 1970s with experiments in training search and rescue dogs.”¹² Mr. Ochsenbein would usher in the modern era of search and rescue dog training. His influence would reach all the way to California and beyond. It is still felt today.

¹¹ Bryson, *Search and Rescue Dog Training*, 4.

¹² Gerritsen and Hawk, *K9 Search and Rescue*, 17.

Chapter IV.

Early Search Dogs in the United States

Search dogs first appear in the United States in the state of Washington, where Bill and Jean Syrotuck and Hank Wilcox helped train and form the first canine search and rescue teams. The Royal Canadian Mounted Police (RCMP) had been training dogs to search for missing people for some time. Bill Syrotuck was born in Canada, and took some of that training with him when he moved to Washington. According to American Rescue Dog Association's *Search and Rescue Dogs*: "Bill and Jean Syrotuck were members of the German Shepherd Dog Club of Washington State, and while their interest at the time was obedience, the [story of a] lost child and the family's dog role in finding her fascinated them. They decided it would be worthwhile to train their dogs to search for lost people. With others in the club, they formed the Search Dog Committee."¹³

Originally, the Syrotuck's plan was to train their dogs in trailing. After some training and realizations that their trailing dogs would be useless in cases where they were called too late, or there was not a scent article available, the Syrotuck's decided to switch to air scenting. This was at the suggestion of Hank Wilcox, a former military canine handler. In the military, Mr. Wilcox' dog had been trained to search for the smell

¹³ American Rescue Dog Association, *Search and Rescue Dogs, Training the K-9 Hero*, 2nd ed. (Hoboken, NJ: Howell Book House, Wiley Publishing, 2002), 1.

of aviation fuel to find missing aircraft in World War II. He thought that training could be applied to searching for humans.

Marcia Koenig is a well-known and respected dog trainer and search dog handler. She has been a part of the search dog world since 1972. On a recent podcast, she spoke about the origins of search and rescue dog work in the United States, saying

“...during World War II, a volunteer civilian organization, Dogs for Defense, helped convince the military to begin training sentry dogs and to find people that were on the fields after they were injured or something like that...One of the people that worked with the dogs belonged to the German Shepherd Dog Club of Washington State...In 1962, members of the German Shepherd Dog Club of Washington State, Hank and Jane Wilcox, and Hank Wilcox was the former dog handler, and then Bill and Jean Syrotuck decided to start a search dog committee. And you know, they tried to work out training and everything. They found that they weren't as successful at trailing work because they would be called so late, or they could be called so late that there really wouldn't be any trail. So, they decided to do air scent work. So Hank Wilcox helped them start that. And then as time went on, there were differences of opinion which is, you know, that's typical. And they broke off into two groups: In July 1965, they were called on their first search, and they thought someone might be missing, but there was no one. But the first success was in May 1966 when they found a 14-year-old boy that had been missing in a rural area for four hours. And of course, that was the spark that got everybody interested. And then in March 1969, Jean Syrotuck's dog Bismarck found the body of a missing skier under five foot of snow on Mount Rainier, and that was their first avalanche find. So in 1969 they formed two different groups, Search and Rescue Dog Association (SARDA) under Bill and Jean Syrotuck, and German Shepherd Search Dogs of Washington State under Hank Wilcox. SARDA has disbanded a number of years ago, but German Shepherd Search Dogs is still working today. So they are the oldest search dog unit in the U.S... At the time, Bill and Jean were getting calls from people around the United States, asking 'how do you start a search dog unit?' So what they would do is come, and on a weekend, they would tell people about it.”¹⁴

¹⁴ Marcia Koenig and Andy Rebmann, *Search Dog Podcast*, NSDA, Episode 2, November 7, 2021.

Some of those units would go on to become American Rescue Dog Association (ARDA) units, offshoots of the original SARDA teams started by the Syrotucks.

Mr. Syrotuck and his wife Jean were significant influences on the search and rescue dog world, and their legacy continues to this day. He wrote the pamphlet *The Search and Rescue Dog Unit, Part 1* in 1969. He wrote the book *Scent and the Scenting Dog* in 1972 in an effort to explain how scent worked and how dogs were able to find humans. It is still considered a “must read” for any prospective search dog handler. He wrote the manuscript *Training Steps for Search and Rescue Dogs* in 1974, but died at the age of 46 before it could be published. Mr. Syrotuck also wrote extensively on lost person behavior, in an effort to yield maximum results by deploying searchers to the areas the missing person most likely went.

The success of the Washington search dogs was heralded and word of the utilization of dogs began to spread. All the way to Heavenly ski resort in South Lake Tahoe, California, where Terry Neumann was located nine weeks after the avalanche took his life.

Chapter V.

California Teams

The evolution of search dogs in California seems to follow a certain path. Visionary people see the need for a certain kind of dog, then a significant event happens that proves out that need. After the event, more people follow that visionary into the specialized field. Certification standards are created, fought over, and adjusted as needed. Then visionary people see the need for an even more specialized kind of dog, and so on.

While Bill and Jean Syrotuck and Hank Wilcox were the visionaries who brought search dogs to the United States, Sandy Bryson brought them to California. Ms. Bryson was trained as a physicist and mathematician at The Ohio State University, and started her career in that field at NASA. The call of the mountains, and Yosemite specifically, pulled her away weekend after weekend. She felt her weekdays working in the San Francisco Bay Area were impeding her time in the Sierras. In fact, she spent enough time in Yosemite, that a ranger there suggested she abandon the physics path, and become a National Park Service Ranger. Bill Wendt, the Park Supervisor at the time, approved her to become a canine handler. Her first dog, a German Shepherd named Hobo, worked with her in Yosemite from 1972 and trained in patrol (apprehension). He was later trained for search and rescue.

Ms. Bryson was in contact with the Syrotucks and attended their trainings in Renton Washington in 1970 and 1971. She also had been introduced to canine search and rescue in her travels to the French Alps. In fact, she was training with the Syrotucks in Renton Washington when the avalanche at Heavenly ski resort happened. At the time,

four canine search teams were flown in from Washington on a C-131 to search. However, Terry had been cast to the side of the slide zone, and the canines were unable to locate him.

Sandy Bryson had a close relationship with Larry Kuhl, who at the time of Terry Neumann's death was the undersheriff for El Dorado County, where Heavenly Ski Resoport is located. Deputy Kuhl brought the idea of forming a search dog unit to Sandy Bryson. She also saw the need for a local team that can respond quickly. This was the birth of the first search dog unit in California. The group that was formed would become Wilderness Finders, Inc., (WOOF).

WOOF began recruiting and training soon thereafter. They modeled their training style after the Washington State unit of the Syrotucks. WOOF attracted a core group of people who would become influential in the rise of the search dog in California. The early WOOF group included Sandy Bryson, Willy Grundherr, and Dr. Jim Murphy.

WOOF first received recognition from the state of California as a non-profit on October 16, 1975, though they had been operating for several years before that. Filings with the State of California in 1977 show Donald Huber as President, Ellen Searby as Vice President, William Schroeder as Secretary, and Raymond Shady as Treasurer. Directors listed are Sandy Bryson, Denise Long, and Roberta Huber.

WOOF was very active, and their members were called to hundreds of searches. One of its most well-known, was the response to the Alpine Meadows avalanche. Avalanche responses are time-sensitive. In a typical avalanche, victims have minutes to hours to be dug out before they suffocate and die, or become hypothermic with the same results. On March 31, 1982, an in-bound avalanche ripped through the Alpine Meadows

ski resort. Seven people died. Canine teams were called immediately to assist. What made this avalanche different from others, is that it destroyed a large structure called the Summit chairlift building. At least three people were pulled out of the avalanche alive by maintenance crews and office staff in the first few hours. But still inside the Summit building was Anna Conrad. On day three post-avalanche, WOOF team Roberta Huber and her dog Bridget alerted to the presence of a buried person. There was a decision, based on weather and snow conditions, that all rescuers needed to evacuate the area due to the threat of additional avalanches. Two days of unsafe weather followed until Bridget could search again. She once again searched and located Anna Conrad, who was pulled out of the rubble alive. It was the first canine find of a living person in an avalanche in North America. She was buried for a total of five days. This event helped motivate ski resorts across North America to create and maintain avalanche rescue dog teams.

WOOF still works in California and Nevada and has produced some of the best search teams in the state. Their membership has grown and shrank over the years, as the original members retire and the newer generation takes over. WOOF members are still active in searching in California and in standard setting in the state and nationally.

Chapter VI.

Start with the End in Mind

To understand the evolution of search and rescue dog teams in California, it requires some basic knowledge of where we stand today. This includes an understanding of the different types of search dogs, the environments they operate in, and the approximate number of each type of team.

Canine search teams are generally categorized first by their overall scenting discipline. They are either trailing dogs that track the scent of a specific missing person, or area dogs that will find any human in a given geographical area. They are then broken down by what they are looking for (living or deceased) and further divided by the environment they operate in (e.g., wilderness, disaster, water, high altitude, urban, avalanche, etc.).

Vi Hummel Shaffer, a well-respected handler and author, describes the main disciplines of canine search and rescue as follows:

- “1. Air Scent General: The K9 tries to detect *any* human scent by sniffing air currents. She works on or off lead and will find anyone in her search area.
2. Air Scent Specific: The K9 first sniffs an object, provided by her handler, which has been in contact with the person she will be searching for. She will ignore all other people and search only for the matching scent. She works on or off lead.
3. Tracking: Some tracking dogs are trained for scent specific work. Others are trained to search for the freshest track. They work on lead. Some people call this work mantrailing.
4. Trailing: The trailing dog is scent specific and follows wherever the particular scent is – not necessarily where the person walked. She works on or off lead.

5. Cadaver: A “cadaver dog” is a generic term used to describe a dog trained to find the scent of human decomposition.

6. Disaster – Live Victim: In this advanced discipline, teams work within a narrow span of time to rescue live victims trapped in collapse structure or debris.

7. Disaster – Deceased Victim: This discipline, typically associated with a mass fatality incident (MFI), requires teams with specific training, not just the use of a cadaver dog.”¹⁵

The classification of search dogs sometimes leads to confusion. To add to this, the process of certification varies among certifying agencies within the state. The California Office of Emergency Services (CalOES) oversees the Law Enforcement Branch and the Fire and Rescue Branch. Both branches have search dogs. The Law Enforcement Branch is responsible for searching for missing persons. This can be everything from overdue hikers, to Alzheimer’s patients, to abductions and crime scenes. The Fire and Rescue Branch oversees the teams that respond to fires as well as natural and man-made disasters. We sometimes refer to the dogs that fall under the Fire and Rescue Branch as disaster dogs.

On the Law Enforcement side of search and rescue, certification is accomplished through multiple Non-Governmental Organization (NGOs) within the state. In addition to setting their own certification standards (with certain minimum standards outlined by CalOES), these NGOs each maintain their own historical place in the search dog world. These teams are almost always comprised of volunteers who purchase, train, equip and respond with their own personal dog.

¹⁵ Vi Hummel Shaffer, *K9 Teams* (Canada: Brush Education. 2018), 8.

On the Fire and Rescue Branch side of search and rescue, the Federal Emergency Management Agency ("FEMA") has established a national standard for certification of disaster dogs. FEMA developed their search and rescue function after a series of disasters in the mid-to-late 1980s. FEMA has traditionally focused on disaster response, but this role has expanded to other natural and man-made events. The CalOES Fire and Rescue branch has adopted the FEMA standard for their disaster dogs. While better funded than the volunteer-driven law enforcement side, there is still a shortage of deployable dogs and a lack of funding to produce more.

The chart below presents the current classifications of search dogs in California.

California Office of Emergency Services ("CalOES")				
Law Enforcement Branch			Fire and Rescue Branch	
Volunteer Handler			First Responder Handler	
Discipline	Trailing	Wilderness (Area)	Human Remains Detection (HRD)	Disaster
Sub-Specialties	Urban	Cross trained Live Find & HRD	Large Source	FEMA - Live Find
	Wilderness	Live Find Only	Disarticulated/Small Source	FEMA - HRD
	Urban Interface	Avalanche	Historical	
			Water	
Ideal Use	Locate specific person using scent article	Clear large open areas of ANY human. All trained with a find/refind. Many cross-trained for Human Remains Detection.	Locate Human Remains in various environments.	Search collapsed or destroyed structures from natural and man made disasters. Typically large scale incidents.
Resource Typing	Environment Typed by location	Environment Typed by altitude/terrain difficulty	Not Environment Typed	Environment typed by structure type/size of pile
Certifying Agency	CARDA Individual County Sheriff Teams	CARDA Monterey Bay Search Dogs WOOF NASAR Individual County Sheriff Teams	CARDA Monterey Bay Search Dogs WOOF NASAR Institute for Canine Forensics Individual County Sheriff Teams	FEMA

Figure 1. Classification of search dogs in California

In California, there are estimated to be about 120 search and rescue dogs in the Law Enforcement branch between trailing, wilderness (area), and human remains detection. This is thought to be about 10% of the entire United States population of search dogs, making the estimates of wilderness search dogs in the United States at just under 1,200 dogs.

There are approximately 85 live-find dogs in the Fire and Rescue Branch and 20 Human Remains Detection dogs in California. In the United States, there are about 315 FEMA certified live-find disaster dogs, and 90 FEMA certified disaster Human Remains Detection dogs.¹⁶ This puts the total search dog population in the United States, across all disciplines, at just over 1,600 teams.

For the Live-Find FEMA dogs, Labrador Retrievers comprise 58.4%, Belgian Malinois comprise 17.8%, Mixed breeds are 6.0% and German Shepherds are 4.4%. For the Human Remains Detection Dogs, Labrador Retrievers comprise 45.1%, Belgian Malinois comprise 16.5%, Dutch Shepherds comprise 8.8% and German Shepherds 6.6%.

There are currently three recognized certifying agencies for the law enforcement branch of CalOES in California. Those are WOOF, the California Rescue Dog Association (CARDA) and Monterey Bay Search Dogs (MBSD). In the past there was also the California Swiss Search Dog Association (CASSDA), which no longer exists. Each group splintered from each other, often over disagreements in certification standards, fitness standards, or plain old personality differences. CARDA founders

¹⁶ FEMA Canine Sub Group, 2024 Rosters, CST K9 Roster December 2024. <http://femacanine.org/>.

originally trained with WOOF, then splintered off to form CARDA in 1976. In 1989 Jan Brennan would splinter off from CARDA to form MBSD. Disagreements among dog handlers on training methodology, certification standards, fitness standards, typing, and dispatch orders are so common place they are to be expected. Often the visionaries see a need that their current organization cannot or will not meet.

The certification process is a long path and unique to each discipline. It takes approximately two years to train each dog. The FEMA system provides a national standard for disaster dogs that all California dogs follow in the CalOES Fire and Rescue Branch side. However, NGO's or local Sheriff's office may set the standard in California for CalOES Law Enforcement Branch dogs, based on certain minimum requirements set forth by CalOES. Typically, dogs must pass obedience, agility, human, and canine aggression tests, as well as a comprehensive search evaluation. It is generally thought that 60% to 80% of canines that enter training will not complete it, though there is no primary research to substantiate this estimate.

There are about 50 trailing dogs in California. They are typically scent specific. This means they use a scent article and follow the scent of one specific missing person. We all can picture the bloodhound sniffing a sock of the missing person and trotting off following the freshest scent of that person until finding them or the trail runs cold. These dogs help search managers determine direction of travel. They can be placed at various intersections and junctions to see if someone has crossed the area. They are incredibly helpful, though little has been researched scientifically to understand how they do what they do. For instance, we know they naturally can track from oldest scent to freshest scent, which gives us the direction of travel of the missing person. But nobody knows

exactly how they can determine the freshest scent in millisecond increments. But they do it.

Wilderness (area) dogs are used to air-scent any people in an assigned sector. This may or may not be the missing person you are looking for. There are about 35 in California at any given time. They are necessary when a scent object is not available to trail someone, or if the missing person case is old enough that the scent trail has vanished.

Human Remains Detection (HRD) Dogs are used to locate the deceased. “Prior to the mid-1990s, no differentiation was made between search and rescue (SAR) and search and recovery K9s.”¹⁷ There are about 35 HRD-only canines in California in the Law Enforcement Branch, though many trailing and area dogs also have HRD certifications. HRD canines, similar to wilderness (area) dogs, search a sector to determine if the missing are in the sector or not. This helps search managers direct resources in the most efficient manner.

HRD differs from searching for the living in the scent picture can vary widely. Whereas the living are generally a homogenous assortment of scents that weigh between 20 to 300 pounds, the deceased body varies widely in its characteristics. They can be whole bodies to skeletonized remains to disarticulated parts to cremated human remains in fires. The scent of the deceased also changes with time, as decomposition progresses. Recently deceased smell differently from decaying deceased, which smells differently from skeletonized or mummified deceased. Manner of death also varies widely and can affect search success. Drug overdoses smell differently from drowning victims, and burn victims from mudslide victims. All produce different scent pictures for the dogs. The

¹⁷ Shaffer, *K9 Teams*, xi.

deceased may be buried or hanging. In cars or in suitcases. And each of these states can exist in a different environment – for example in wilderness, water, avalanche, disaster, mudslide, or fire, etc. All must be trained for that specific scent in those specific environments to be reliable and successful.

Search and rescue dogs are lauded for their ability to find missing people. But that is the least common end to a search for the majority of canine teams. While it is true that dogs are used to find people, from a search management point of view, there is an equal value to searching an area and not finding someone. Search managers need to efficiently manage their limited resources of searchers and canine teams, to quickly find the missing person who may be experiencing a medical event or be out in poor weather that can kill them quickly.

A canine team that clears a sector lets search managers eliminate the search area from further work because they have determined the person is not there. Managers can now reallocate resources the next highest probability area. Teams work this way until the person is found. While we like to give credit to the teams that find the person, behind them are often dozens of search areas that were searched and cleared by other canine teams, who help direct search efforts to the one area the person actually was in. We rarely give those teams credit, although they should also be recognized for getting their search problem “right,” because the person was not in the area.

Canines are generally considered the most efficient form of searching. While there is no hard science behind this, it is conventional wisdom that one canine team is equivalent to ten human searchers. In this sense, canine teams are a force multiplier on

searches. “Dogs are a limited resource” says Mark Ghilarducci, the former director of CalOES. “They allow us to amplify the capabilities of the team.”¹⁸

This efficiency is largely due to their incredible sense of smell, which remains unrivaled by technology. Scientists have long been working on creating sensors that can rival a canine’s sense of smell, and some say they are getting close. However, the “perception of a narrowing gap is not supported by the peer reviewed reports. Even though sensor supported technology continues to advance (subsequently leading to the creation of scent/odor detection devices with greater and broader selectivity and sensitivities than their predecessors), the dog’s olfactory system is imbued with many more layers of complexity, adaptability/plasticity, and genetic diversity than can be achieved with any current state-of-the art orthogonal detector technology. In the final analysis, we observe that no single machine is currently available that can outperform nature’s original biosensor, the dog.”¹⁹ In short, the search canine is still the last best hope for a missing person.

¹⁸ Interview with Director Mark Ghilarducci by the author on February 24, 2025

¹⁹ Lauryl Degreeef and Craig Schultz. *Canines the Original Biosensors* (Singapore: Jenny Stanford Publishing, 2022), 22.

Chapter VII.

Rise of CARDA

In California in the early 1970s, the German Shepherd Dog reigned supreme as THE working dog. Law enforcement agencies used German Shepherds almost exclusively. Civilian dog sports, such as Shutzhund (now known as “IPO” - short for International Prufungorden) were popular. People took their personal dogs and competed in Schutzhund, which tested the dogs in a variety of events including tracking, apprehension, and search. The Schutzhund clubs were the hotbed of the time for people who wanted to train their dogs to the highest level possible.

CARDA officially started in 1976, but in June 1977, Willy Grundherr, who hailed from Switzerland but then resided in California, had recently parted ways with WOOF. He approached a group of handlers after Shutzhund training in Sacramento. He asked if they wanted to train their dogs for search and rescue. That group included Bill Dotson and Phyllis Hiatt. Mr. Grundherr also later recruited Shirley Hammond. Shirley recalls in the *Dobie Tails* newsletter, “I was judging a tracking test at Vallejo, CA, when a man introduced himself as Willy Grundherr and he was forming a new search dog group, California Rescue Dog Assoc. (CARDA), and he invited me to a meeting in Truckee, CA. I found out that several of my friends were going and decided that I would go and find out what this was all about.”²⁰

²⁰ Shirley Hammond, “Dobermans in Search and Rescue,” *Dobie Tails*, Doberman Rescue of Nebraska, November 2011. 1. <https://doberescue-ne.org/wp-content/uploads/2015/07/Dobie-Tails-November-2011.pdf>).

The very early years in CARDA were shaped by important members such as Willy Grundherr, Bill Dotson, Shirley Hammond, Barbara Adcock, and Bev Peabody as the organization defined its mission. Generally speaking, WOOF was becoming the high altitude, backcountry search team that operated in the Sierras. WOOF was built on high standards of physical fitness and backcountry prowess. CARDA was largely comprised of folks in the Bay Area, the Central Valley, and the Sierra Foothills.

In the early years, the search dogs were multi-purpose. This was before the era of specialization, and search dogs were expected to operate in a wide variety of terrain and mission sets. Thus search dogs would operate in the wilderness and the disaster zones, at sea level, and in avalanches in the high country and for searches where it was unknown if the person was alive or dead. This was before CalOES's creation of the Urban Search & Rescue (US&R) teams. Trailing, as we know it today, was not really being done. Many of the handlers came from the Schutzhund world, so the dogs and handlers had background in tracking, not trailing.

CARDA's original wilderness certification test was by today's standard very basic. It consisted of finding a hidden person in a 100-meter by 500-meter area (approximately 12 acres). Evaluators would determine if a team passed and was "Mission Ready" by judging the performance of the dog and the team. This made the testing process a bit subjective. That test has since evolved over several iterations. Today, evaluators test a wilderness area team in a 100-to-120-acre area with up to three victims. This test must be completed in 3 hours.

Bill Dotson recalls CARDA's first official search was on Mount Shasta for a hiker missing for over a year. "We searched up there for a couple of days, but didn't find

anything” he says. Bill Dotson would later be credited with CARDA’s first dog find. “We were searching for a teenager in the middle of the night. I called out his name and someone answered back. Not sure if that’s a dog find but people still wanted to give me credit for it” he laughs.²¹

In its original filings with the state of California for Incorporation, CARDA lists its incorporation date on October 18, 1977. Its primary activity listed is “Training & Operating Dog Teams for Avalanche-, Disaster-, & Wilderness Search” with Willy Grundherr as President. Incorporating Officers include Jan Brennan, Barbara Adcock, and Phyllis Hiatt. CARDA filed their January 1978 newsletter with their application for incorporation. Its lists Bob Hoffman as operation leader for avalanche with Mike Chelette as the assistant. It lists Mike Chelette as the operation leader for wilderness. Willy Grundherr is operation leader for disaster with assistants Bill Dotson and Phyllis Hiatt. It also includes the CARDA roster at the time, which lists the following as members of CARDA: Mike and Peggy Chelette, Lauren Derock and Mel Dickman, Willy Grundherr, Bill and Carolyn Dotson, Phyllis Hiatt, Sheri Marsh, Bob Hoffman, Bev Peabody, Lucille Whithington, and Manny Ennis.

Barbara Adcock met Willy Grundherr around 1977 along with Shirley Hammond and Rosalie Simpson Alvarez. CARDA was recruiting out of local Schutzhund clubs such as the Peninsula Schutzhund Club. Most of the early handlers were avid dog trainers as well. According to Barbara Adcock, “CARDA was small at the time. You were expected to attend the monthly trainings, and there would be about 10 people there. Your

²¹ Interview with Bill Dotson by the author on September 2, 2024.

local training group would be 2 or 3 people. Willy Grundherr, Phyllis Hiatt, and Shirley Hammond were all interested in doing disaster, and were doing pieces of it at the time.”²²

Through Willy Grundherr, CARDA had a close relationship with the Swiss Disaster Dog Association. This organization still exists and today is known as REDOG. Urs Ochsenbein, who I mentioned earlier, led the organization then, and in the time before email, DVDs, or YouTube, would send cassette tapes to CARDA members to assist them in their training. In July 1977, Willy Grundherr, Phyllis Hiatt, and Bill Dotson flew to Zurich, Switzerland. What they thought was going to be a training trip turned into a Mission Ready disaster test under the Swiss. The relationships they built led to an exchange program of sorts, where Urs Ochsenbein and his peers would come to California once a year, and CARDA would send members to Switzerland. “Many of both the wilderness certification standards and FEMA standards can be traced to this organization and Urs Ochsenbein”²³ says Bill Dotson.

During this time, teams were learning how to do larger and more complex searches. As the organization grew, policies were needed and processes needed to be formalized. New policies were being written or expanded to ensure that handlers could competently use map and compass, administer basic first aid, and use the radio professionally. New teams were brought in to the organizations.

Dispatching issues with Law Enforcement Branch dogs were still being sorted out. How Sheriffs would call for dogs varied from county to county in the early days. Sometimes they would call WOOF directly. Sometimes it would be CARDA. Sometimes

²² Interview with Barbara Adcock by the author on September 12, 2024.

²³ Interview with Bill Dotson by the author on September 2, 2024.

it would be the closest handler who would then call the closest other handlers. Nowadays, CalOES Law Enforcement Branch does most of the dispatching for the state. County Sheriffs can request mutual aid from neighboring counties who may or may not have canine teams, but if they want to access the larger list of canine search teams, they go through CalOES.

This was not always the case. Many county Sheriffs felt that they should have the right and ability, at their level, to call any dog in the state directly that they want to come search in their county. To some degree, there was a split along these lines between WOOF and CARDA. WOOF was close with county Sheriffs in the Sierras, and their members would often be called directly to come search. CARDA, through the work of Larry Peabody (Bev Peabody's husband) sought to organize the Sheriffs and push them to utilize CalOES. Mr. Peabody was successful in building relationships with CalOES, so CARDA would often get the first call. Mr. Peabody was also the longtime CARDA Dispatcher. Many a handler recalls Larry Peabody waking them up with a phone call in the middle of the night with the phrase "guess where you are going tonight". WOOF relied on personal relationships with county Sheriffs to get calls directly. By this time CARDA was a larger organization than WOOF, and covered more of the state. In many ways it was easier to call CARDA because they could provide more dogs to more places. While no WOOF member would say it on the record, many WOOF handlers argue CARDA sacrificed quality for quantity. Some of the disagreements and squabbles of the late 1970s and early 1980s still carry forward forty years later. Another example of the tribal nature of the search dog culture.

Chapter VIII.

Specialized Disaster Dogs

Bill Dotson is a founding member of CARDA and was its training director. He worked at UC Davis in the 1970s as a microbiologist where he performed research on immunology. He moved to Virginia in 1982, but he carried his work with dogs with him. He is a leader in the FEMA world, the wilderness area search dog world, and the HRD world, among others.

While he was in California, he was instrumental in getting CARDA off the ground when some of the basic foundations in California search work were created. His move to Virginia was critical for the creation of the national disaster search dog. In the early 1980s, disaster work was not a separate certification. Handlers were not so specialized that they ONLY did disaster work. Search dogs were still search dogs. But there were early innovators who saw the need for specialization. Bill Dotson, Shirley Hammond, and Phyllis Hiatt were among them. It is important that Mr. Dotson cut his teeth in the search dog work in California, because years later, it would be Virginia, led by Bill Dotson, and California, led by Shirley Hammond, that would join forces to create the foundations of the FEMA response system we know today.

Looking back, it seems clear that the writing was on the wall for the need for these specialists. But few saw the need as clearly and early as Bill Dotson and Shirley Hammond. A series of disasters occurred that would push a separation of these dogs from the wilderness teams, specifically, the 1985 Mexico City earthquake, the Armenian earthquake in 1988, and the Loma Prieta Earthquake in 1989. As the needs evolved, so did the search and rescue dogs.

Prior to the creation of a FEMA response system, federal international humanitarian efforts were run by the Office of Foreign Disaster Assistance (OFDA). OFDA showed a willingness to send disaster search dogs to Mexico, El Salvador, and Armenia between 1985 and 1988. These international deployments were critical because they demonstrated the need for heavy rescue teams with search capabilities in large natural disasters. It was known that the west coast of the United States has many active fault lines, and could be impacted by an earthquake similar to Mexico City. The pictures, videos, and experiences from the responders demonstrated that the United States was not prepared to respond to a significant seismic event. The 1989 Loma Prieta earthquake made that threat a reality.

Mexico City

The Mexico City Earthquake occurred on September 19, 1985 at 0717 Central time. It had a magnitude of 8.0 and was centered about 220 miles away from Mexico City. Certain geographic features of Mexico City caused the shaking to be much worse in certain parts of the old town. Specifically, Mexico City was built on the ruins of Tenochtitlan, the Aztec City that was conquered by the Spanish in 1519. Tenochtitlan was built on an island in the middle of Lake Texcoco. After conquering the native Aztecs, the Spanish embarked on draining the lake and filling it in. Hundreds of years later, this became a significant reason for liquefaction occurring. The liquefaction caused the underlying soil to become unstable and buildings to collapse.

In total, 954 buildings collapsed and 2,831 buildings were damaged,²⁴ despite Mexico City having some of the most stringent building codes due to previous earthquakes, most recently the earthquake of 1957.

A large group of canine handlers were attending the National Association of Search and Rescue (NASAR) meeting in Nashville Tennessee to discuss national standards. Upon hearing of the Mexico City earthquake, they began advocacy for deployment through OFDA. Thirteen dogs were deployed to Mexico City, many from CARDA.

Shirley Hammond, now deceased, responded with her Doberman Pinscher Cinnamon. In a 2011 interview, she recalled

“In 1985 the Mexico City earthquake happened. Ten CARDA dogs responded to this earthquake. It was an experience I will never forget.” She continues “150 San Antonio Abad was a clothing factory that had collapsed. The floors were being held up in some places by the huge bolts of cloth used in the industry. There was no way in, but a young Mexican cook had been climbing through this building looking and listening for signs of life...I was a member of Search team three, and we were assigned to this building. When we arrived and looked at the building in total collapse, it seemed impossible to search. However, this cook had crawled around in there and had thought he heard humans, but was unable to get closer. When we arrived on site and were briefed, it didn't look like it was searchable. I did not speak the language, so communications were very simple. I somehow communicated to the cook that Cinn needed to rest before we began searching. I needed to gather my thoughts as well. After a few minutes we began crawling, following the cook. I don't know how long we had been crawling when we had a large aftershock! It was the first aftershock that I had been aware of. There were small chunks of concrete and dust falling all around us. As I lay there wondering if I would ever get out of this place. I started thinking, why am I here and not home or at work? It was all very nerve racking to say the least. Soon things quieted down and we started following the cook. I can't remember how long, but we were getting close to the area where the cook heard what the thought were humans trapped. Through sign language and hand gestures, in the

²⁴ "Lessons Learned: USAID's Office of Foreign Disaster Assistance and the 1985 Mexico City Earthquake." *Association for Diplomatic Studies and Training*, <https://adst.org/2018/06/lessons-learned-usaids-office-of-foreign-disaster-assistance-and-the-1985-mexico-city-earthquake/>. 18.

next place where Cinn and I could pass the cook, I gave Cinn the search command. She started off and we followed. Then Cinn got to a place where she couldn't go any farther. She began digging at the rubble and started to bark. Both the cook and I thought we heard people calling out. I turned on my radio and prayed it would work in this mess. Outside of the search area the Westinghouse Technical Van was stationed and they picked up the call and relayed the message that the dog alerted on live people. Now began the task of how they would retrieve them. The only thing we could do was to leave...Not too long after that we were at the airport waiting to board the plane for home, when one of the US Embassy Employee's notified our Embassy escort that they retrieved 12 workers from 150 San Antonio Abad. Some were badly injured, but they were all still alive. This was perhaps the most important event in my total time in search work."²⁵

Bev Peabody, another founding member of CARDA, also responded to Mexico City. In an interview with National Geographic, she said "The thing that really got disaster work going for dogs was the Mexico City earthquake," Peabody recalled. "I was there five days and the dogs found eight people alive in the rubble. The dogs alerted on a collapsed parking tower, and when they got the victims out it was a grandfather and a grandson in a VW bug—alive." The Mexican people showed their gratitude by showering the dogs with treats. "They would have gained 30 pounds there if we'd let them," said Peabody."²⁶

Oliver "Ollie" Davidson, OFDA Administrator, says

"The best thing that we did was to send members of the National Association of Search and Rescue (NASAR). They were meeting in Nashville and had rescue dogs and rescue specialists, all meeting with this nonprofit national organization. They kept calling and calling and saying, 'We can help, we can help, we can help.' Well, we didn't know what they could do and we didn't know what kind of help was really needed down there, but there were people trapped and these were dogs that could go into the rubble and smell humans,

²⁵ Shirley Hammond, "Dobermans in Search and Rescue." *Dobie Tails*, Doberman Rescue of Nebraska, November 2011. 2. <https://doberescue-ne.org/wp-content/uploads/2015/07/Dobie-Tails-November-2011.pdf>.

²⁶ Brian Handwerk, "How Search-and-Rescue Dogs Find Survivors," *National Geographic Online*, June 25, 2021. <https://www.nationalgeographic.com/animals/article/rescue-dogs-behavior-animals>.

hopefully live people not just bodies. Eventually we said, ‘Okay we’ll send an aircraft.’ We picked up a group of these rescue people and sent them to Mexico City. The Metro-Dade Fire Service Spanish speakers were going out on their days off and training people in the mostly Spanish-speaking countries on fire fighting and rescue and in the airport rescue. We decided that the fire service had the depth of people that we really needed, so the OFDA ended up in a Cooperative Agreement with the Metro-Dade Fire Service. This was in early 1985. They were coming and going on mission to various Latin American countries when the Mexico City earthquake hit. We immediately sent a Metro-Dade rescue team headed by some of the firefighters to Mexico City. Well it turned out when we added it all up, we sent about 147 people to Mexico City with no management.”²⁷

The experiences in Mexico, good and bad, were a crucial education for the handlers. It led directly to canine teams, led by Shirley Hammond, to start to specialize in disaster response. “Shirley was the one that started the California disaster thing after her experience in Mexico City”²⁸ says Adela Morris, herself a recognized leader and innovator in human remains detection. In an after-action report it was stated “limits abound in disaster operations, and a primary one is the sheer complexity of a disaster the magnitude of the Mexican earthquake. The vastness of the search and rescue task, involving some 954 collapsed buildings with estimated tens of thousands of people trapped in them, presented the search and rescue teams with an extraordinarily difficult problem for action. Compounding the complexity was the urgency of time. The chances of rescuing survivors alive from the debris declined with each hour, each day of delay in search and rescue operations.”²⁹

²⁷ "Lessons Learned."

²⁸ Interview with Adela Morris by the author on September 12, 2024.

²⁹ Louise Comfort, *International Disaster Assistance in the Mexico City Earthquake, Quick Response Research Report #03*, Natural Hazards Research and Application Information Center, University of Colorado, Boulder, 1986, 18.

Armenia

The 6.8 magnitude Armenian Earthquake took place on December 7, 1988, at 11:41am. An estimated 50,000 were killed in the event.³⁰ Mickhail Gorbachev, despite the cold war, requested help from the international community. There was an outpouring of support. OFDA sent search dogs and rescue teams from Virginia, including Bill Dotson. This deployment was on the heels of Mexico City. The international experience was showing search dog handlers that we needed to be prepared for similar disaster response in the United States,. At this time, FEMA’s Urban Search & Rescue teams had not been created yet, and Heavy Rescue teams among local fire departments were nascent.

San Bernardino Train Derailment

The year 1989 was an important year for disaster search dogs, largely because the Loma Prieta earthquake created the impetus for creating state and national specialized Urban Search & Rescue (US&R) search teams. These teams appear first in California, and then that model was copied across to the nascent FEMA US&R system. But before Loma Prieta, a train derailment in San Bernardino helped create a proof-of-concept for disaster search dogs. The *Los Angeles Times* wrote:

“San Bernardino awoke to one of its worst disasters May 12, 1989, when a freight train hauling 69 cars full of trona derailed and crashed into a residential neighborhood at Duffy Street. Eleven homes were seriously damaged and four people were killed...But because the trona, an ash-like compound of hydrous sodium carbonate, had blanketed the area, rescue workers had no way to know whether anybody else was buried under the debris...The state Office of Emergency Services called for search-and-rescue dogs by 10 a.m., but it was not until six hours later that Shirley

³⁰ Esther Fein, “Soviet Aids Say Death in Quake May Reach 50,000,” *New York Times*. December 10, 1988.

Hammond and her red Doberman, Cinnamon, arrived from Northern California. Within minutes of its arrival, the dog picked up a human scent and local resident Chris Shaw was rescued.”³¹

By all accounts, this rescue appears to be the first find for a disaster dog in California, and likely the United States. But 1989 had a much larger disaster in store for California.

Loma Prieta Earthquake

I was 17 years old and entering Candlestick Park for game 3 of the World Series when the Loma Prieta Earthquake occurred. My mom and I were on the lower escalator into the Park, and I looked up to see the upper escalator banging into the concrete façade of the upper decks. Having been born and raised in California, and used to the earthquakes, I did not think much of it. We continued into the stadium to meet the rest of my family, where we were sure the Giants would take home their first win of the Series. In 1989, the die-hard fans carried transistor radios to the games, so they could hear the play-by-play and get information on stats and injuries. They came in handy that day, because it was through the radio we learned of the Bay Bridge Collapse and a fire in the Marina. A San Francisco Police cruiser told us through its loudspeaker that the game was postponed. We left the stadium and returned to our cars. I remember Rickey Henderson in the passenger seat of his Mercedes driving by in the parking lot, still wearing his

³¹ Dianne Klein, “Dogs trained for Disaster Are an All-Too-Rare Breed,” *Los Angeles Times*, March 5, 1994. <https://www.latimes.com/archives/la-xpm-1994-03-05-mn-30123-story.html>.

Oakland A's uniform. It was not until the next day, when power returned, that we learned about the Cypress Structure in the East Bay.

The Loma Prieta Earthquake struck at 5:04pm local time. The nation watched as Al Michaels was interrupted on national TV by the earthquake. National attention was focused on the San Francisco Bay Area as they got to watch the devastation and response play out live, broadcast right to their homes. The earthquake was a 6.9 magnitude and centered in the Santa Cruz Mountains, about 44 miles away from San Francisco. 63 people died and 3,757 were injured. The large earthquake, which seismologists had feared and seen in Mexico City, Armenia and El Salvador, had hit home.

It is one thing to send help to foreign countries. It's another to see the destruction in your own backyard. The collapse of the Cypress Structure freeway in Oakland challenged new Heavy Rescue crews at the time. Local crews had to rely on tradesmen and contractors with the equipment to access and search parts of the freeway. While some folks had seen the need for such abilities, the state was not as prepared as it needed to be to respond.

Shirley Hammond responded to the Cypress Structure, where she was lifted to search the structure in the bucket of an excavator and was supported by Adela Morris. Shirley and several other CARDA members also responded to the San Francisco Marina District and to Santa Cruz. Barbara Adcock also responded to Santa Cruz. The lesson that came from it all: California needed to drastically augment its Urban Search & Rescue capabilities, including search dogs.

The Museum of the City of San Francisco has an article titled “*Overview of Fire Service Responses near the Epicenter of the Loma Prieta Earthquake*” by Edward J.

Phipps, a retired San Francisco Fire Chief:

“After the earthquake, the California Fire Chief's Earthquake Response Committee later found that: "The fire and Rescue Division of OES should be given the financial support and organizational strength to provide aggressive proactive leadership during a major earthquake disaster. The Loma Prieta earthquake shows us that local fire chiefs do not have the capacity to understand the full magnitude of damages for hours after the initial earthquake. The local prediction of the amount of equipment and personnel needed is difficult at best. OES Fire and Rescue has the ability to scope the bigger picture much quicker than the local fire chief. For that reason, our mutual aid system for earthquakes must be different than for normal fire and rescue mutual aid. The response system should be designed so OES Fire and Rescue leadership has the power to request and coordinate regional support based on the magnitude and location of the earthquake epicenter, without waiting for local requests to move the system forward.”³²

These events served as wake-up calls for the need for specialized resources that were capable of searching in these austere environments. In the early days of canine search and rescue in California, there was no specialization. A steady dog could work in the wilderness or on rubble. They could find living or dead. So, what makes a disaster dog different than a wilderness dog?

Disaster adds an element of unsteady or uncomfortable footing for the dogs. There are many dogs that can make fine wilderness search dogs, but when asked to work on collapsed structures where footing is less sure and void spaces must be jumped over or descended into, many dogs stop searching and go into survival mode. It takes a special dog with courage to continue to search in environments like this. Wilderness areas are

³² Edward J. Phipps, *Overview of the Fire Service Response Near the Epicenter of the Loma Prieta Earthquake*. Museum of the City of San Francisco. Undated. <https://sfmuseum.org/1989/report.html>.

generally stable and safe, with some exceptions. Disaster environments are inherently dangerous until the potential energy of a building has come to its final resting spot.

Disaster dog handlers require a different alert because of these safety concerns. Wilderness area dogs will perform a find/refind sequence where the dog goes to the missing subject, then returns to the handler and performs some sort of alert before bringing the handler back to the missing subject. In disaster work, handlers do not want to risk an injury by having the dog return to the handler. Instead, they stay and bark where they determine the strongest scent is.

One result of the Loma Prieta Earthquake was the creation of the eight California Urban Search & Rescue teams in 1989 shortly before the formation of the FEMA national response capability. These were comprised mostly of firefighters, but also included doctors, structural engineers, and logistics people. They could travel anywhere in the state, departing within 3 hours and be self-sufficient with their own communications, water and food. It was a program that FEMA would base their 26 (now 28) FEMA Urban Search & Rescue teams on. “There are 26 of the elite squads nationwide, established by the Federal Emergency Management Agency after the 1989 Loma Prieta earthquake. The California Office of Emergency Services developed a network of eight teams statewide, and in 1990 the federal government modeled a national program after California’s.”³³

Congress recognized this too. “As a consequence of the Loma Prieta earthquake of 1989, Congress and FEMA revisited the scope of NEHRP (National Earthquake

³³ Richard Simon, “Terror in Oklahoma City: Rescue Teams Labor in Tedious Search for Survivors: Bombing: Using trained dogs and high-tech devices, members work on their hands, knees and even bellies to look for signs of life in the rubble.” *Los Angeles Times*, April 22, 1995.

Hazards Reduction Program). FEMA established the National Urban Search and Rescue Response System that same year.”³⁴

People like Shirley Hammond, Bill Dotson, Bev Peabody, and Jan Brennan saw the need for these types of dogs to respond to future disasters. They began to push for separate certifications that more accurately reflected and tested dogs in the disaster search environment.

The Northridge earthquake struck on January 17, 1994 at a magnitude of 6.7 on the Richter Scale. Dogs did not play a major role, but it was another wake-up call. “There are only seven working dogs certified ready for disaster work, the toughest there is”³⁵ a *Los Angeles Times* story read. It goes on to say “disaster dogs, who inhabit yet another realm in the service of human beings, are much scarcer than the other working types. About four years after California developed its system of eight urban search-and-rescue units - and assigned four dogs and handlers to each 56-member team - the state is still 25 dogs short.”

³⁴ Bea, Keith Jones, *Urban Search and Rescue Task Forces: Facts and Issues*. Library of Congress, Washington DC, Congressional Research Service, 2010.

³⁵ Klein, “Dogs trained for Disaster Are an All-Too-Rare Breed.”

Chapter IX.

Oklahoma City

The Oklahoma City bombing occurred on April 19, 1995 at 9:02 a.m. It remains the largest act of domestic terrorism in United States history. A Ryder moving truck packed with a homemade ammonium nitrate and fuel oil bomb exploded outside the Alfred P. Murrah Federal Building in Oklahoma City. It killed 168 people, including 19 children, and injured more than 600 others. The explosion caused massive damage to the building itself, as well as other surrounding buildings.

There was an immediate response from the Oklahoma City Fire Department and state and federal law enforcement agencies. Firefighters, police officers, and emergency medical personnel arrived at the scene within minutes, working to rescue the walking wounded survivors and extinguish fires. The scale of destruction and size of collapse required specialized federal assistance, marking the first large-scale instance of a coordinated effort among local, state, and national agencies for disaster response.

According to the *Los Angeles Times*: “The teams in Oklahoma City – from Los Angeles, Sacramento, Phoenix, Virginia Beach, Va., Montgomery County, Md., and New York City – were joined by dozens of volunteer emergency workers and firefighters from across the country, from Santa Monica and Torrance to Lyndhurst, Ohio.”³⁶ The original 6 teams on the ground would be augmented by other California teams, including California Task Force 3. At that time in California, disaster dogs were shared among teams because they were such a precious resource and there were so few of them. It

³⁶ Simon, “Terror in Oklahoma City.”

would be several years later before each of the eight California FEMA teams would have their own dedicated search dogs.

There were fewer than 15 Type 1 FEMA search and rescue dogs in the country when the Oklahoma City Bombing occurred. All were of the live-find variety, as FEMA did not have an HRD program at that time. FEMA coordinated the logistical response, bringing in resources from across the nation to assist with search and recovery efforts. Dozens of canine teams from across the country were deployed, enduring hazardous conditions such as sharp debris, unstable footing, and smoke. California teams included Shirley Hammond, Bob Macaulay, Pat Grant, Lynne Englebert, Sharon Gattas, Gayle Laroche, Annie Laird, and Wilma Melville.

Local search teams were responsible for locating several survivors in the first hours after the bombing – though none were canine finds.. As the rescue phase transitioned into recovery, live-find SAR dogs helped locate victims' remains, providing closure to grieving families. This is not something that is within their normal duties – but several of the dogs had exposure to human remains previously. Their change in behavior, while not a trained final response, let attuned handlers know their dogs had located deceased victims. The lack of dog teams certified to respond to this level of disaster increased investment in SAR canine training and resources in subsequent years.

The bombing also highlighted the importance of interagency cooperation during emergencies. Ray Downey, considered a founder of modern heavy rescue and US&R techniques, led the federal search operation on the ground. Chief Downey was later killed in the response to the 9/11 attacks. California Task Force 3 would be involved with the delicate structural engineering calculations that determined if it was safe to work in the

shadow of the blast zone, led by David Hammond (Shirley Hammond's husband). The coordinated efforts of local, state, and federal agencies modeled the importance of collaboration in disaster response. The canine teams, while a scarce asset, were prepared for the environment if not the scale of the disaster. One handler, Wilma Melville, saw the need for many more trained search dog teams. Born from the tragedy of the Oklahoma City Bombing was the National Disaster Search Dog Foundation (SDF).

The SDF was founded as a non-profit in 1996 with the audacious goal of re-imagining how disaster search dogs are trained and certified to increase the number of search dogs available to respond in the FEMA system. Prior to this, search dog handling was almost strictly a civilian volunteer activity. Wilma Melville's vision was to pair a paid professional firefighter with a pre-trained dog. By employing professional dog trainers rather than volunteer handlers, the training of the dog could be cut from about 24 months to fewer than 12. Thirteen SDF trained dogs responded to the 9/11 attacks. Today 85 of the 315 certified live find dogs in the FEMA system were trained by the SDF. Wilma Melville and Paul Lobo reported that "In 2017, Wilma finally passed the benchmark of 168 teams trained, honoring her private commitment to the victims of the Oklahoma City Bombing."³⁷

Wilma Melville, at 91 years old now, has more energy and vitality of most people half her age. Opinionated and driven, she was a force for change in how search dogs were trained and procured for those working in the disaster response systems. Wilma started with CASSDA in southern California with Willy Grundherr. He had left CARDA at this point, and would often bring the Swiss trainers to California to train. The Swiss were still

³⁷ Wilma Melville and Paul Lobo, *Hero Dogs, How a Pack of Rescues, Rejects, and Strays Became America's Greatest Disaster-Search Partners* (New York: St. Martin's Press, 2019), 313.

heavily involved in disaster search. “Novice handlers were expected to train green dogs” she says “and that takes a lot of time and creates a lot of frustration”. After the Oklahoma City Deployment, Wilma was introduced to Pluis Davern in Gilroy California. “The sun came out when I met Pluis Davern” Wilma says. “There is a professional that can train me and my dog several days a week.” The Search Dog Foundation, under Wilma’s leadership, sought to professionally train rescued dogs and pair them with a professional firefighter. This model more closely resembles how law enforcement procures patrol canines. This was a stark change to the volunteer-led search and rescue paradigm that existed prior. Wilma reports that wilderness handlers were “horrified” that she would give a trained dog to a firefighter who “had not paid their dues.”³⁸

Another need emerged from the Oklahoma City Bombing. However, we would need a couple more disasters before these assets came into prominence. Specialty cadaver dogs go by several names: Human Remains Detection (HRD) dogs, HR dogs, cadaver dogs, or body dogs to name a few. They have been around since the early 1990s but few handlers were involved in this discipline until the late 1990s. The need for these specialized resources became evident after a series of national events. Specifically, the 9/11 attacks and the Space Shuttle Columbia recovery.

³⁸ Interview with Wilma Melville by the author on December 3, 2024.

Chapter X.

9/11

I lived in the “frozen zone” in Manhattan, which was the area that was closed to traffic south of 14th street. I had left early that morning and drove north for a meeting in Connecticut. We were interrupted by news of the attacks. We spent the night there, planning on how we were going to sneak back into Manhattan. On September 12th, I walked down to as close to ground zero as possible. I passed St. Vincent’s hospital, where doctors and nurses waited for the flood of rescued victims that would never come. When I was stopped at the barricades near the World Trade Center, they were looking for first responders, iron workers, and heavy equipment operators. Nobody had use for a 29-year-old investment banker.

The weeks after the attacks were a surreal time in the City. There was no honking from the taxis. People spoke in hushed tones. We walked by the hundreds of missing persons posters hung in Union Square in reverent silence.

The September 11, 2001, attacks in New York, the Pentagon, and Pennsylvania initiated the largest search and rescue response in FEMA’s history. It was clear within the first couple of days that these were recovery missions, not rescue missions. Two thousand seven hundred and forty people died at the World Trade Center. One hundred eighty-nine were killed in the Pentagon, and forty-four were killed in Pennsylvania. The best technology for finding deceased people is the HRD dog, and none existed in the FEMA system at the time. Dog handlers being dog handlers had adapted and overcame. Many FEMA handlers had HRD dogs outside the official FEMA system that were being worked in wilderness scenarios. Those of us that work in the disaster and wilderness

scenarios often cross train in the different environments to create a more well-rounded search partner.

There was one live-find from a canine in the hours after the collapse. A German Shepherd named Trakr has been credited with the only canine find of a live person at Ground Zero. Genelle Guzman-McMillan credits Trakr and a guardian angel for being the last living person to be pulled from the rubble. According to Jon Bausman, “Trakr was a German Shepherd that found the last survivor of the World Trade Center terrorist attacks, Genelle Guzman-McMillan. She had been trying to get to the bottom of the South Tower building when it collapsed. Trakr discovered her after she’d been trapped for 27 hours beneath rubble and concrete.”³⁹

An estimated 250 to 300 search dogs responded to the sites of the attacks, with an additional 60 HRD teams or so working at the Fresh Kills landfill. Twenty-one FEMA Task forces responded to the World Trade Center, and 5 responded to the Pentagon. Overall, twenty-six of the twenty-eight FEMA teams responded to the event. California had the largest presence of any state – FEMA California teams 1, 3, 4, 6, 7 and 8 responded to the World Trade terrorist attacks. Most of the canines deployed were still Live-Find dogs, but there was a significant response of cross-trained or HRD specific dogs. These teams played a crucial role in recovery efforts, offering not only their specialized search skills, but also giving comfort to victim families and other first responders. Among the California handlers were veterans of Oklahoma City like Shirley Hammond and her big Doberman Sunny, Bob Macaulay and Orion, and Lynne Englebert

³⁹ Jon Bausman, “Remember the 9/11 Dogs 20 years Later,” *Outward Hound*. September 2, 2021 <https://outwardhound.com/furtropolis/dogs/9-11-dogs#:~:text=Trakr%20was%20a%20German%20Shepherd,hours%20beneath%20rubble%20and%20concrete.>

and Lucy. Reflecting on her dog's performance, Shirley Hammond said, "I would like people to judge Sunny on his behavior and his contributions to mankind. I have done search and rescue for twenty-seven years. We have found live victims and those that did not survive. Dobies are wonderful friends, loyal companions, and great working dogs."⁴⁰

Dozens of other canines from California also deployed to New York, including the initial graduating class of the three from the SDF including Rob Cima, Rick Lee, and Randy Gross. There were thirteen dogs trained by the SDF to deploy to New York.

A study conducted by the University of Pennsylvania's Penn Vet Working Dog Center monitored the health of 9/11 search and rescue dogs for 15 years and found that few of the deployed dogs experienced significant health issues in the years following their service. "We anticipated that the dogs would be the canary in the coal mine for the human first responders since dogs age faster than humans and didn't have any of the protective equipment during the response," Otto says. "But we didn't see a lot that was concerning." In fact, the median age at death for 9/11 dogs was about the same as the control group: 12.8 compared to 12.7 years. The most common cause of death for the dogs that deployed was degenerative causes – typically euthanasia due to severe arthritis – followed closely by cancer, though the risk of cancer was about the same as in control group dogs."⁴¹

The efforts of SAR dogs during 9/11 did not go unnoticed by the general population. The dogs represented man's best at a time of national crisis. The attention

⁴⁰ Nona Kilgore Bauer, *Dog Heroes of September 11th, A Tribute to America's Search and Rescue Dogs*, Tenth anniversary edition (East Petersburg, PA: Companion House Books, 2011), 113.

⁴¹ Katherine Unger Baillie, "Tracking the Working Dogs of 9/11," *Penn Today*. September 21, 2020. <https://penntoday.upenn.edu/news/tracking-working-dogs-911>.

and new found public awareness for these dogs and their handlers grew significantly. Donations to organizations like the National Disaster Search Dog Foundation grew exponentially. Many SAR dogs from 9/11 were honored in the years following the attacks, including appearances on television, at sporting events, memorial events, documentaries, and even books.

The lessons of the 9/11 response were clear. There needed to be training on bigger and more complex piles. Handlers needed to wear PPE that limited their ability to communicate with the dogs – specifically respiratory protection. Few had trained with that prior to the event. And most glaring was the need for specialized disaster HRD teams. There simply were not enough of them, and they were not generally supported by the FEMA task forces prior to the event.

Chapter XI.

Space Shuttle Columbia

On February 1, 2003, the Space Shuttle Columbia disintegrated upon reentry into Earth's atmosphere over Texas, resulting in the loss of the spacecraft and all seven astronauts on board. This disaster scattered debris over a vast area spanning East Texas and parts of Louisiana, triggering a unique search over a massive amount of territory. While the death toll was comparably low when compared to 9/11, the search area spread for miles. A massive effort to recover as much of the crew remains was put forth. Wilderness and FEMA teams alike were called into action to scout the countryside. The canine teams were expected to differentiate between animal remains and human remains. Jurisdictional challenges abounded. Some of the teams from California included Dick Taylor and Hooper, Adela Morris and Riley, Lynne Englebert and Lucy, Eva Cecil and Nessie, and Bev Peabody and Legend all deployed with FEMA California Task Force 3. All were training partners and proteges of Shirley Hammond.

Initial efforts in the debris field were led by humans walking a closely spaced grid line looking for debris and remains. After several days, it was realized the canines could make much more efficient work of searching for human remains. HRD Canines can detect small amounts of human remains that may go unnoticed by ground searchers. They can also differentiate in the field between human and non-human anatomical materials. The dog's ability to navigate challenging terrain and locate critical evidence expedited the search process and increased the overall efficiency of the operation. Their efforts helped ensure that the astronauts were treated with dignity and respect, providing closure to grieving families and colleagues.

K9 teams deployed to search areas deemed high priority based on radar cross-section data, witness reports, and preliminary findings by civilians and ground searchers. The size of the debris field required a systematic approach, which took some time to get planned and implemented. Handlers worked their dogs through grids marked for search, carefully observing them for indications of scent detection. When a canine alerted its handler to a potential find, the area was flagged for further investigation by specialized crews.

The Columbia recovery mission highlighted both the capabilities and limitations of canine search teams. It was reported that many of the dogs' alerts were not on human remains, but rather "pig, deer and other animals."⁴² There were also reports that handlers pushed their dogs past the point of fatigue, making them ineffective. There were also reports that at least two handlers dogs did not alert on verified human remains, but the handlers did not take them out of the field.⁴³

This event led to a focus on improving specialized human remain detection dogs. The challenges of this sort would not be the last. They would be seen again in Paradise, Lahaina, Hurricane Helene, and the LA Wildfires. One of the critical lessons learned from this operation was the importance of integrating canine units into broader disaster response planning. It was clear the HRD specialization was incredibly important, but it was also clear the FEMA disaster dogs needed to be proficient in wide area searching, rather than just rubble pile work. The wilderness teams had an advantage there, though they are often cross trained.

⁴² Shaffer, *K9 Teams*, 346.

⁴³ Shaffer, *K9 Teams*, 346.

The Columbia recovery mission underscored the need for continued investment in the training, support, and improvement of specialized HRD resources.

Chapter XII.

Water, Mud and Ash

A series of disasters that included floods, mudslides, and conflagrations that burned through populated areas helped provide valuable lessons to canine search and rescue teams. Each response tested the canines and helped make handlers evolve and improve for the next search.

Katrina

Hurricane Katrina struck the gulf coast in August 2005 near New Orleans. It was one of the most devastating natural disasters in U.S. history, leaving widespread destruction and flooding. In the aftermath of the storm, thousands of people were left stranded, and the region was in dire need of rescue operations. The public's opinion was that FEMA's response was generally considered a failure of the FEMA National Response framework. In the post-debacle congressional report, the investigators state: "It remains difficult to understand how government could respond so ineffectively to a disaster that was anticipated for years, and for which specific dire warnings had been issued for days. This crisis was not only predictable, it was predicted. If this is what happens when we have advance warning, we shudder to imagine the consequences when we do not. Four and a half years after 9/11, America is still not ready for prime time."⁴⁴

⁴⁴ *A Failure of Initiative Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina*. Washington, DC: U.S. Government Printing Office, 2006.

Canine teams were assigned flooded areas, wrecked buildings, and debris, areas where traditional search methods would have been ineffective, because they could only be reached by boat. The dogs' ability to detect interior scents from the exterior of buildings, even when submerged in water or buried under rubble, or in the attics of houses, made them useful in certain search, specific operations. But canine searching at Katrina was limited.

New Orleans was flooded, and rescue workers faced immense challenges in reaching and identifying survivors. Thousands of homes and buildings had been either severely damaged or completely destroyed. As search teams conducted their operations, canine teams provided support by searching areas that might have otherwise been overlooked or deemed too dangerous. Unlike the 9/11 response, the dogs were not the center of the show.

Canine teams had to adapt to this environment. Teams were no longer searching rubble piles, debris fields, or open fields. They were on boats, and many of them had never searched from a boat before. Handlers were forced to kennel their dogs and spend time documenting and mapping, rather than running their dog. According to FEMA, over 300 canine teams were deployed during the disaster, with many coming from local and out-of-state agencies.

The San Bruno Pipeline explosion

The San Bruno pipeline explosion occurred on September 9, 2010, in San Bruno, California, when a 30-inch natural gas transmission pipeline owned by Pacific Gas and Electric Company ruptured and exploded, resulting in the deaths of eight people, injuries

to dozens, and the destruction of 38 homes. The blast left a crater 72 feet long and 26 feet wide in a residential neighborhood.

This was not California's first conflagration and search of a burned neighborhood. The Oakland Hills Fire on October 19, 1991 had killed twenty-five people, burned over 2,800 single family homes and over 400 apartment units. Search dogs were used there, but not to the degree they would in the San Bruno Pipeline Explosion where every home was searched by a canine.

Strike teams from northern California arrived to fight the San Bruno fire, and search operations were planned for the next day. In 2010, the FEMA HRD system was not yet officially recognized, It was mostly wilderness search dogs from the Law Enforcement Branch that responded to San Bruno. Some of those canines were of the typical wilderness variety – trained to alert on both live find and human remains. Some were single-purpose trained dogs. They came from CARDA and the Canine Specialized Search Teams (CSST), a HRD focused team attached to the Santa Clara County Sheriff's office. Cross-trained canines made alerts at residences that were later determined to have missing deceased individuals that were confirmed by single-purpose dogs. This was an important shift. Canines would be expected to alert on cremated human remains. Anthropologists were invited in to sift and identify bones and bone fragments. In later fires, including Paradise, the North Complex, Lahaina, and Los Angeles, we would begin to see the partnership of more specialized HRD canines and the expertise of the anthropologists needed to verify human remains.

Oso

On March 22, 2014, a mudslide devastated the small community of Oso, Washington. Heavy rainfall and unstable soil conditions triggered the slide, which occurred when a portion of a hillside collapsed, sending millions of cubic yards of mud, trees, and debris across the Stillaguamish River valley. 43 people died in the event, leaving rescuers to face a challenging recovery mission.

Mud is an incredibly difficult environment to search in. When it is wet initially after a slide, it can be almost impossible to travel through, as you sink in. It is physically exhausting for human and canine. The mud wants to suck the boots off your feet. Dogs sink to their bellies. Depending on the consistency of the mud, it acts like water and engulfs humans and suffocates them, leaving little chance of survival. It permeates the small voids where victims would have survived in a building collapse. Then, as days go on, the mud hardens and entombs its victims, leaving very little air flow that is needed to detect human remains. Depending on the ambient outside temperature it cools victim remains, making detection even more difficult. The mud cakes everything, and makes everything the same color, and it is difficult to identify a human body because it blends into the environment.

The immediate response in Oso involved local residents, emergency services, and volunteers, but the scale of the disaster required federal assistance. Search and rescue efforts were hampered by the unstable terrain, deep mud that reached over 50 feet in some areas, and fears of additional slides. In addition, the search area was large, stretching over one square mile.

Mudslides through populated areas create a toxic sludge. Household hazardous chemicals and septic waste contaminate the site, posing health risks. Swimming pools become impossible to see and identify, creating a hazard for humans and canines. Septic tanks and manhole covers get removed creating fall hazards. Human remains are often moved long distances from where they originated in a washing machine effect which may leave trace scent source over large distances. Suzanne Elshult, who responded to Oso with her dog Keb, reflected about the experience. “Did I keep Keb safe? The honest answer is, the answer that still wakes me up at night, is no. The mud plains of the Oso landslide were strewn with chemicals, sewage, and in some places human remains. All of us, the fire crews, the SAR volunteers who responded, the loggers from the local community who joined the search, should probably have been wearing HAZMAT suits.”⁴⁵

Newer technologies like GPS mapping and aerial surveillance were employed to assist the operation. Dogs played a crucial role in locating human remains in areas where traditional methods were impractical due to the mud. Rescuers adopted innovative approaches such as using heavy machinery to sift through debris and carefully excavate layers of mud for canine teams to search. Oso showed that HRD handlers had to be able to perform in this new, unexpected environment. Dr. Jennifer Brown stated before Congress, “when all live victims have been accounted for but there remain people among the missing, the human remains detection dogs are deployed to help bring closure (for) the victims and the families associated with the disaster. This is exemplified in 2014 following the massive mudslide in Oso, Washington. After local and State responses

⁴⁵ Suzanne Elshult and Guy Mansfield, *A Dog's Devotion, True Adventures of a K9 Search and Rescue Team* (Lanham, MD: Lyons Press, 2022), 46.

were overwhelmed, nine taskforces deployed another 20 dogs to help respond and find and locate the victims of the Oso Mudslides in Washington State. At the cessation of operations when all teams were demobilized all but one of the victims were brought home to their family.”⁴⁶

Dr. Jennifer Brown continued, “in 2014, we (FEMA) began a system of certifying human remains detection dogs. They had no formal role within the Urban Search and Rescue System prior to that time. They still do not – are not a mandatory requirement, unlike the live find dogs is that no US&R team is deployable without at least four certified dogs to go out the door with them. They are a mandatory requirement.” The impact of these disasters was a recognition that search dogs needed to evolve once again, and Human Remains Detection dogs would lead the way in future recoveries.

Montecito

On January 9, 2018, a catastrophic mudslide occurred in the town of Montecito, California. The event was triggered by heavy rainfall over the burn scar of the Thomas Fire – one of California’s largest wildfires in recorded history. The mudslide buried homes, blocked roads, shut down highway 101, and caused 23 fatalities. Knowing the risk of a possible debris flow, responders were prepositioned ahead of the storm to react immediately to this danger. Among those prepositioned was Eric Grey and his dog Riley of the Santa Barbara County Fire Department.

⁴⁶ *From the Border to Disasters and Beyond: Critical Canine Contributions to the DHS Mission*: Hearing before the Subcommittee on Oversight and Management Efficiency of the Committee on Homeland Security, House of Representatives, One Hundred Fifteenth Congress, First Session, May 18, 2017. (Washington DC: U.S. Government Publishing Office, 2017).

The Montecito mudslide occurred during the predawn hours, when the community, already reeling from the aftermath of the Thomas Fire, was asleep and unprepared for the ensuing devastation. Torrential rains turned the steep hillsides into fast-moving torrents of mud, rocks, and debris. The hillside above Montecito was weakened by the loss of vegetation due to the fire, which had destroyed much of the local plant life.

Search and rescue teams, including local fire departments, the Santa Barbara County Sheriff's Office, and state agencies such as CalOES and the National Guard, mobilized quickly after the slide hit.

The first 72 hours of the search were critical for locating live victims. The engulfing nature of mud, combined with the cool temperatures meant trapped victims were at risk for suffocation or succumbing to hypothermia. One living person was pulled from the mud the next morning. In the days following the disaster, the search shifted focus from rescue to recovery as the likelihood of finding live victims diminished. Live-find dogs were kenneled and HRD were dogs deployed. The efforts were met with mixed results; some victims were recovered swiftly, while others remained buried for weeks, complicating the closure process for families.

Despite the extensive efforts, the search operation eventually concluded with the identification of all victims. Throughout the recovery efforts, the community of Montecito demonstrated resilience, with neighbors supporting one another during this traumatic period. To this day, one victim remains unaccounted for.

HRD canines successfully made several finds of deceased individuals in Montecito. The Montecito mudslide showed, once again, that HRD canines were the best

tool available for detection. Search dogs were evolving to be adaptable to the conditions they were asked to work in. It is nearly impossible to recreate the environment of a mudslide for training, so handlers need to show the dogs similar environments if they want the dogs to be successful. This includes things like avalanche training, rubble training, and working in green waste.

Paradise

The Camp Fire, which erupted on November 8, 2018, in Butte County, California, was one of the most devastating wildfires in United States history. It burned through the towns of Paradise, Magalia, and Concow, killing 85 people and destroying over 18,000 structures. Search and rescue dogs played a pivotal role in locating victims and providing closure to grieving families.

Paradise was the first of a series of conflagrations that would require a large-scale search and rescue response. CalOES Law Enforcement Branch and Fire and Rescue Branch both deployed their HRD teams. Anthropologists, mostly from Chico State University, were on scene to verify (or not verify) the veracity of canine alerts.

Initial challenges were the number of people reported missing (more than 1,500 originally) and the unique environment associated with responding to a fire scene. Many of the canine teams arrived with the best of intentions, but few had worked in a disaster environment – specifically a burned environment. Few of the canines (even the specialty HRD canines) had trained on the unique scent of cremated human remains. The certification tests for HRD canines in California do not include tests for cremated human remains. In addition, cremated remains are difficult for civilian volunteer handlers to obtain to train with. The result was that many of the handlers hoped their dogs would

alert if confronted with a victim, but few were totally prepared to operate in that environment.

The result was a mixed performance. Some dogs worked very well, and some struggled. The anthropologist's view of search canines was not improved by that deployment. Many of the canine teams in Paradise were working in an environment they had not trained on, searching for a scent they had not trained with. The results were predictable: handlers said their dogs showed "interest" in areas, but not a trained final response, which left search managers to send anthropologists out to these addresses to confirm or deny a find. Many of the handlers, anxious to not miss anyone, incorrectly interpreted their dogs behavior. As a result, the historical efficiency and accuracy of canines was brought clearly into question.

Many of the handlers had worked house fires before, but the difference between the common house fire fatality and Paradise is that house fires are extinguished by water to stop the burning process, whereas in Paradise the houses burned for days until the fuel, including victims, was all gone. House fire victims largely die from smoke inhalation, not flame impingement, so bodies are usually intact. In Paradise, many of the victims were in a cremated state. Adjustments for future deployments would need to be made.

The North Complex

The North Complex Fire burned in Northern California's Plumas and Butte counties in 2020. Much of the searching was in the same county as the Paradise response. Originating from multiple lightning strikes on August 17, 2020, the fire rapidly expanded, ultimately consuming approximately 318,935 acres. This made it one of the

largest wildfires in California's history. The fire resulted in 16 fatalities. Fourteen victims were residents of Berry Creek, and two were from Feather Falls. CalOES Fire and Rescue Branch and CalOES Law both responded.

Since the Paradise Fire, search strategy had been improved by CalOES. Now Fire and Rescue Branch teams would search inside the structures, where there were more hazards. Unsupported walls and chimneys, and complex rubble made it more suitable for Fire and Rescue Branch people to search, as they had the training to identify and mitigate those hazards, and the personal protective equipment to operate safely inside. In addition, Fire and Rescue Branch is made up almost entirely of firefighters, who in California have some presumptive protections for things like cancer.

The Law Enforcement branch was generally assigned to search the perimeter of buildings, as well as wilderness area where people may have fled to escape the fire. This would become the response model as California faced more conflagrations.

This event was significant for more than just the size of the fire. It was important because it showed that events like Paradise were not once-in-one-hundred-year events, and California was adjusting its response model to efficiently search. More fire responses would come.

Lahaina

The Lahaina Fire began on August 8, 2023, and burned through the historic town on the island of Maui, Hawaii, in August 2023. The official death toll was 102, with two people still unaccounted for. The search for victims has involved a multi-agency effort, including local authorities, FEMA, and the U.S. military. Human Remains Detection Dogs were deployed by FEMA from all over the United States, including California, and

were instrumental in the search. This would be FEMA's first large-scale deployment of HRD teams.

The identification of victims presented another set of challenges. The intensity of the fire left many remains unrecognizable, similar to Paradise, requiring advanced forensic techniques such as DNA analysis to confirm identities. Forensic anthropologists, once again were sent to Lahaina.

This fire was significant because it demonstrated that large-scale conflagrations of towns were possible outside of California. While there had been search operations previously in Oregon and Boulder, Colorado, the Lahaina search was of such a scale it garnered national attention. The clear need was for human remains detection dogs that are trained to alert on cremated human remains. To date, there is not a certification evaluation in California that tests for the ability to locate that particular scent.

Los Angeles

The January 2025 wildfires in Los Angeles marked one of the most devastating natural disasters in the city's history, with the search for victims presenting significant challenges. The fires, driven by powerful Santa Ana winds reaching up to 100 mph, led to widespread destruction and a complex search and rescue operation.

The wildfires, notably the Palisades and Eaton fires, resulted in the loss of over 10,000 structures. As of January 25, 2025, there were 27 confirmed fatalities and 26 people still reported missing.⁴⁷

⁴⁷ Los Angeles Fire Department official Facebook page January 25, 2025.

The search and rescue response was handled entirely by California teams. A combination of Task Forces and regional task forces, and the canines associated with them, came from all over California. One challenge was that many dog handlers are also firefighters – so while there were active fires burning they were not able to search with their dogs. Other departments faced staffing shortages, so they would not allow their handlers to be deployed to assist the people of Los Angeles in finding the missing. Still, those that could deploy and were allowed to deploy searched valiantly and helped clear structures and bring closure to the grieving. California had evolved and refined its search operations to efficiently use their canine assets to lead the searches.

Chapter XIII.

The Trailing Dogs

Humans have used trailing dogs for centuries. We vary what we have them trail, whether that is fox, deer, or nowadays humans.

Given the right conditions, trailing dogs can be the most efficient way to locate missing people. No air-scent search dog can beat a well-trained trailing dog for ending a search quickly. The trailing dog mission has remained largely unchanged since we have begun using search dogs. Specialties have emerged in recent years – testing for urban areas and wilderness areas is required to achieve certification, but the underlying mission remains the same.

That being said, there are limits on utilizing trailing dogs. This harkens back to Bill Syrotuck's original concerns about trailing dogs. Trailing dogs are limited in the sense they need to arrive on scene while there is still scent available for them to follow. If trailing dogs arrive on scene too late, and scent is not available, their use will be limited. In addition, trailing search and rescue dogs need a scent article to target the missing person's path. If there is no scent article, the trailing dogs are unable to work.

Most people picture bloodhounds when they think trailing dogs. This is largely due to the "prison break" movies we were exposed to on television. Nowadays, bloodhounds are not seen as often, replaced by other breeds such as German Shepherds and Belgian Malinois. They rely on their exceptional olfactory systems, which are estimated to be 10,000 to 100,000 or up to 300,000 times more sensitive than a human's. Dogs can detect individual scent particles and distinguish them from other odors, allowing them to follow a trail even in challenging conditions. This capability is

especially valuable in California, where varied climates, terrains, elevations, and population density can complicate search efforts.

Many early CARDA members used tracking techniques to train their search and rescue dogs, largely based on their roots in Schutzhund trials or AKC obedience. But tracking is different from trailing. Tracking has the dog follow scent from footstep-to-footstep. It is precise and detailed. It does not miss a step. However, trailing work has the dog following the scent trail laid by the missing person – which includes scent on the ground where they stepped, scent in the surrounding vegetation where it blew off the person as they walked, or scent directly from the person themselves. Tracking is very nose-down, pinpoint work, whereas trailing uses all the scent clues left by the missing person to find that person. Trailing dogs may end up cutting corners to get to the freshest scent. This makes trailing much more efficient and more applicable to search and rescue than tracking.

Hatch and Judy Graham moved to California in 1981. They brought off-leash trailing techniques to California that never caught on with the larger group. However, Jerry Newcomb is generally credited with bringing modern trailing techniques to California, with CARDA members Fran Roelfsema, Rhonda Dyer, and Shay Cook mentoring dozens of trailing teams.

California is an incredibly large state, and in the early to mid 1980s, northern California was where the wilderness area work was done. There were far fewer area dogs in southern California at that point. Likewise, there were virtually no trailing dogs in northern California, while Mr. Newcomb's training group, LA Search Dogs, thrived with many successful trailing teams becoming certified. Mr. Newcomb eventually merged LA

Search Dogs with CARDA, and CARDA had a new resource that law enforcement could call on. This asset was well known and utilized in southern California, where Sheriff departments would often call Mr. Newcomb directly rather than go through CalOES. Frances Roelfsema, who worked closely with Jerry Newcomb, moved to northern California in 1988, bringing a certified trailing resource to the San Francisco Bay Area.

Trailing in northern California, dispatched through CalOES channels, was not immediately embraced. Many Sheriff departments did not understand trailing dogs, having been trained that a search dog is a search dog. When they requested dogs, they expected wilderness (area) dogs. It took some education, and proven results, to show that trailing dogs were often the most efficient way to conclude a search. Requesting agencies had to learn what a trailing dog was, how they worked, how to preserve the scent article for the canines, and to call them as soon as possible while the scent was fresh. This took some time.

Today, there are more trailing dogs than wilderness (area) dogs in California. The legacy of Jerry Newcomb and his proteges like Frances Roelfsema is that trailing has an enormous importance as a tool for search managers. Trailing dogs, in addition to following the freshest scent of the missing person, can also do “sign-cutting” or checking intersections to see if the missing person was there. This is incredibly helpful on busy urban streets when you need to know if someone crossed a busy intersection, or in the wilderness at trail junctions. It provides a direction of travel for search team managers to more efficiently plan and execute a search.

As technology advances, some wonder if the role of trailing dogs, and search dogs in general, will be diminished as we become more reliant on drones, GPS, and other

innovations. These tools often complement rather than replace the unique abilities of trailing dogs. Drones can survey large areas quickly, but they lack the scent-detection capabilities of a well-trained dog. Drones equipped with thermal imaging may one day finish searches, but the trailing dogs give them direction to fly.

Chapter XIV.

The State of Training and Handler Issues

The joke goes something like this: The only thing two dog trainers will agree on is that the third one is doing it wrong.

The dog training world in general is at an interesting and volatile time. There are traditional “balanced” dog trainers with years of experience and thousands of hours of hands-on time with dogs. These trainers use both positive reinforcement and correction techniques and tools (aversives) when training the dogs. These trainers long held beliefs are being challenged by relatively new groups of intellectuals studying dogs.

The study of dog science is relatively new. Upstart academics are running experiments to explain how dogs learn. This is an exciting new development. However, it is often difficult to translate lab results to the field for improvement of working dogs.

However, there are balanced trainers who are integrating the lessons from the labs to become “holistic” dog trainers – people like Michael Ellis, Dr. Stewart Hilliard, Cameron Ford, and Forrest Micke, are getting the most out of dogs by maximizing play, modern training methods, and minimal aversives (pulls on the leash, use of electronic collars, pinch collars, etc.).

Finally, there are the Internet influencers and positive reinforcement trainers, whose ethos is to use force-free, science-based methods to train dogs. They point fingers at everyone who uses aversives and calls them unethical and abusive. The force-free community is an important advocate for dogs but is criticized for citing only the science that supports their opinions, and ignoring or dismissing the science that shows otherwise. All these groups often clash on training methodology. Social media has not helped to

bring the various camps together. In short, how you decide to train your dog is a controversial mess.

In order for a dog to be successful as a search and rescue dog, it must possess certain traits, which are largely genetic. These traits include athleticism, nerve strength, biddability, trainability, and inherent drives related to hunting and catching prey. They must not give up when they are tired, or cold, or slightly injured, or frustrated with their handler. They must be hard-headed in some manners, and have the confidence that they can work on uncomfortable surfaces that most dogs would avoid at all costs. In short, our partners are amazing. But they are not your typical house dogs. And they usually make terrible pets.

Search and rescue handlers also need certain traits. Generally speaking, search and rescue dog handlers tend to be type A personalities. You have to be. Similar to the dogs we select, there seems to be a mix of drive, determination, pain tolerance, and comfort being uncomfortable. The profession also tends to attract people who stand up for what they feel is right. Some would say that handlers have an oversized ego, and in some cases that is correct. There is a certain amount of hubris one must possess to believe you can partner with another species, train them to be reliable enough to be the last best hope of a missing person.

Search dog handlers are often passionate people who strongly believe their methodology and mission is the “best.” Back in 1994, in a Los Angeles Times article, this dynamic was pointed out: “Their dogs get along much better than they do,” says Mark Ghilarducci, manager of the program in the Office of Emergency Services. “The handlers can be their own worst enemies. We can’t get them to agree on a damn thing.” The article

continues “The same can be said for dog people nationwide. “We are all strong-minded and have got an opinion,” says Bill Dotson, a nationally recognized dog trainer who works with Virginia’s Dogs East.”⁴⁸

The search and rescue dog profession also has attracted its share of frauds, hucksters, and narcissists. They tend to appear when large-scale events happen. National events from 9/11 to Hurricane Helene bring people and their pets out of the woodwork claiming to be search dog handlers. Invariably, they claim their dogs have many finds (over 100 for some of these folks) and seek to raise money to cover their travel, training, and time. Sometimes these frauds offer their services for hire, preying on grieving families searching for loved ones who will pay any amount for a canine to be deployed. Search and rescue handlers should never self-deploy and never charge for their services. These frauds do disservice to a noble profession, and are usually quickly identified and their reputations tarnished. However, people like Sandy Anderson have gone even further and actually planted evidence at scenes, then claimed their HRD dogs made a find. She gained national and international fame, before her antics were made public. This led to her conviction and jail time, and the release or overturning of convictions for several people. Ms. Anderson is one of several examples where human hubris and ego have diminished the good work of search dog teams.

It is expected search dogs will excel in all environments, and be 100% accurate. Yet there is very little support given to search and rescue dog teams. For example, human remains detection teams may be asked to search for whole bodies, small bits of body parts post explosion, cremated human remains after a conflagration, or a 20-year cold

⁴⁸ Klein, “Dogs trained for Disaster Are an All-Too-Rare Breed.”

case where the accused may have buried a juvenile. Yet the organizations that expect the teams to do this provide little to no training or financial support to train the dogs, and no access to the scent sources they are expected to locate.

Did you ever wonder how handlers get anatomical parts to train their human remains detection dogs? Government agencies in California do not provide access to those sources. Some handlers buy human bones online (yes, you can do that). Some handlers save placenta post-birth. Some handlers draw their own blood. But it is nearly impossible for a handler to get access to whole bodies, or bodies in a condition like we will search for (small bits, cremated, burials, etc.). We are not allowed to put human remains in most waterways (understandably) to train them to work on water. In many places it is illegal for handlers to even possess the very training aids they need to be able to competently train their canine partners. Yet somehow, handlers figure out how to train and be successful.

Most handlers are volunteers. They equip themselves and their dogs, pay for trainings, and even the gasoline to drive to searches. Yet when the dogs struggle, have a miss, or aren't perfect, people are prone to criticize. Nobody asks a firefighter to come to a wildland fire and cover the cost of his own chainsaw and fuel, but dog handlers are expected to pay their own expenses.

Despite these challenges, handlers continue to be successful. Today, we understand a lot better how to train a dog than in the early days. Understanding drive and motivations, and improving canine selection has helped improve the overall quality of the dogs.

Chapter XV.

The Next Evolution

The biggest place of evolution continues to be in human remains detection. Beyond traditional search and rescue, organizations are taking human remains detection to the next level. Institute for Canine Forensics (ICF), led by Adela Morris, uses their canines to locate human remains that are sometimes over 1,000 years old. Lynne Englebert reports “The oldest we have identified is estimated to be over 9,500 years old.”⁴⁹ This is helpful to identify burial grounds of indigenous people, often encroached on in new construction. They have also endeavored to find the resting places of important historical figures such as the Donner Party in California and Amelia Earhart.

Closer to home, the ICF has been operating in the fire zones in places like Paradise, Lahaina, and Los Angeles. But they are not there to identify the remains of people who died in the fire. Rather, they are there to find the cremated remains once stored in urns in the homes that were burned. Many people keep their loved one’s urns displayed on their mantles or in the back closet of their houses. Lynne Englebert leads these missions to recover these remains. They had over 200 recoveries of remains of loved ones in the Camp Fire alone.⁵⁰ It is a testament to the dogs that they can distinguish between the ash in the house and the ash from the broken urn. This detailed level of search is slow, methodical, and detailed, and highlights another way canines are finding people.

⁴⁹ Interview with Lynne Englebert by the author on August 30, 2024.

⁵⁰ Interview with Lynne Englebert by the author on August 30, 2024.

Chapter XVI.

Conclusion

Today, using canines for detection has become a sport for the public. Detection sports like nosework and barn hunts are ways for people to go out and enjoy using their dog to find things. In fact, they are the fastest growing dog sport. The popularity of these sports is no doubt in large part to the coverage that search and rescue dogs receive when they are deployed.

Canine search and rescue remains almost entirely a volunteer occupation. Even the FEMA teams, who are compensated when they are deployed, receive very little to no funding to train and equip their dogs. Handlers volunteer thousands of hours per year in training, and thousands of dollars in fuel to travel to training locations. They are an incredibly resourceful bunch. When a new problem is identified, they will work to be prepared for the next time they are called. When deployments happen and they feel unprepared (which is almost all deployments), they will go home and figure out how to improve and be ready for the next deployment. All of this for no pay and no recognition. To me these volunteers and their canines represent the best of humanity.

As handlers, we sometimes get lost in the details of what patch we wear on our shoulder or our specific search discipline. We miss that we are all part of a wonderful community of good-hearted, altruistic people doing our best. Hopefully, sharing some historical background will serve as a unifying agent to help us realize we have a shared background. When the next big search happens, we will all be on the field together, and hopefully on the same team. Tribes within the canine search and rescue exist, but in

reality the differences between them all are pretty small in California. They are much smaller than what we are indoctrinated with as new handlers.

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