California Camp Fire Deployment

Search Canine Injury and Illness Data Report

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Introduction – Dr. Gordon

Presented is the thirteenth report in a series of reports by the author to document the occurrence of Search Canine illness and injury incurred during deployment to a disaster. Prior papers include the Haiti Earthquake (2010)[1,2], Joplin, MO Tornado (2011)[3], Hurricane Sandy (2012)[4], Moore, OK Tornado (2013)[5], Colorado Floods (2013)[6], SR-530 Oso, Washington Landslide (2014)[7,8], Nepal Earthquake (2015)[9] , joint report of three Hurricanes: Harvey, Irma, and Maria (2017)[10], Hurricane Florence (2018)[11], and Hurricane Michael (2018)[12].

The purpose for documenting this information is to provide insight as to the nature of Search Canine medical issues, using the data to modify medical care training, deployment preparation, logistical supplies, and preventative measures. Medical and veterinary first aid courses, designed to encompass emergent and non-emergent care, can be modified to emphasize real-world documented conditions. When limitations on equipment and supplies exist, priority can be placed on equipment and supplies for conditions most likely to be encountered. Handlers, medics, and other personnel will have insight to hypervigilance for certain conditions and implement preventative measures to avoid commonly encountered medical issues.

Deployment to a large scale post-fire event presents environmental conditions not before documented with respect to hazards, safety concerns, weather fluctuations, decontamination challenges, illnesses and injuries specific to Search Canines. Comparison to previous canine data reports reveals similarities and differences. It is the author's hope that lessons learned may be applied to future deployments in all environments in a continuing effort to maintain operational capability of deployed search canines so that they may complete their mission safely and arrive home healthy.

Event History – Drs. Gordon and Ho

The Camp Fire was the deadliest and most destructive wildfire in California history to date, the deadliest wildfire in the United States since the Cloquet fire in 1918, and among the list of deadliest wildfires, it was the sixth-deadliest U.S. wildfire overall. Named after Camp Creek Road, its place of origin, the fire started at sunrise on Thursday, November 8, 2018, and was first reported at 6:33 a.m. PST, near Pulga, California, near Camp Creek Road in Butte County, California. The fire reached 100% containment after seventeen days on November 25, 2018.[13]

During the first week in November 2018, Red Flag conditions[14] (ideal wildland fire combustion and rapid spread) existed throughout California with high winds and low humidity. Once the Camp Fire began, extreme fire behavior fanned by 50 mile per hour winds created an unprecedented fire storm. Although the fire most noticeably involved the entire town of Paradise, 6 other surrounding communities including Magalia, Centerville, Concow, Pulga, Butte Creek, and Yankee Hill were also devastated, resulting in a fire zone of 240 square miles, an area larger than Chicago.

Over 26,000 inhabitants were forced to undergo emergency evacuation as the fire raged out of control, eventually destroying nearly 14,000 homes and nearly 5,000 other buildings including rest homes, churches, shopping centers, a hospital, and five public schools. Some 5600 firefighters, using 622 engines, 102 bulldozers, 24 helicopters, and 122 fixed winged aircraft fought the firestorm. Ironically, at the same time the Camp Fire began, two other large fires broke out in Southern California, the Woolsey and Hill Fires, burning out of control from Thousand Oaks to Malibu.

The environmental impact was immediately felt throughout Northern California, with dense smoke pollution spreading as far down as the San Francisco Bay and Sacramento areas, causing multiple public school closures due to the extreme public health dangers. Within the fire zone, environmental contaminants including asbestos, heavy metals, dioxins, and incinerated commercial and household hazardous materials were everywhere. In particular, hundreds of burned out vehicles with spilled antifreeze, battery acid and volatile organic compounds were present.

Canine Deployment Response – Dr. Ho

Within the state of California the location, recovery, and identification of deceased missing persons falls under the jurisdiction of law enforcement and coroner agencies. The State of California Office of Emergency Services (OES) coordinates response and provides mutual aid assistance from throughout the state. The operations of search, rescue, and recovery fall under the Law Enforcement Division. Assets include volunteer and uniformed personnel, including canine teams trained in Human Remains Detection and certified under California OES Search and Rescue Mutual Aid Guidelines, appendix B, Cadaver. The number of qualified HRD teams is approximately 35 statewide. Additionally, Cal OES has a Fire Division which coordinates mutual aid assets including Urban Search and Rescue (US&R) Task Forces consisting of 12 Regional Task Forces and 8 FEMA National Task Forces. .

In a large scale disaster, veterinary care is assisted by the California Veterinary Medical Reserve Corps (CAVMRC). CAVMRC provides veterinary professionals to support all animals affected by a disaster, including pets and farm animals, and is a resource for all working dogs in the field. Additionally, in Northern California, the University of California, Davis School of Veterinary Medicine deploys a Veterinary Emergency Response Team (VERT) to the scene while the U.C. Davis Veterinary Hospital is the referral facility for canine emergencies and trauma involving responding working canines. To assist in the decontamination of search personnel and canines, the California National Guard provided on-site decontamination equipment and personnel to facilitate this process.

In the immediate aftermath of the destruction of the town of Paradise and surrounding communities during the Camp Fire, resources to account for over 1000 reported missing and deceased victims were mobilized even as the fire perimeter continued to burn out of control. The initial callout for volunteer search and rescue HRD teams involved all 35 qualified teams within the state, who worked in rotational deployments during the first week. By the second week, these assets were supplemented by additional HRD teams from the regional and national US&R task forces and the State of Oregon.

Executive Summary

Data Collection

Survey response from canine search team volunteers and mutual aid USAR Task forces was >60%, a good representation of the subjects, compared to more commonly reported returns of an internal survey to be 30-40%.[15] In addition, all but 1 survey was returned in less than a month, more than half before 2 weeks had passed from individual search team demobilization. This increases accuracy confidence for responses that rely on memory. Additionally, many handlers digitally and manually record their mission events for post-deployment after action reports (AARs) and canine law enforcement records, so even the one received 6 weeks later has validity.

Handler Information

Having accumulated from 3 to 23 years on a team, with an average of 12.5 years, and having deployed for an average of 78 missions, handlers were both experienced and long-serving. Being of local response in nature, it is not surprising the majority of member affiliations are with state and county teams. Qualified and reliable Canine Search Teams (CSTs), whether volunteer or paid, demands both dedication and a willingness to serve in harsh environmental conditions for days to weeks. The rewards of intense training are evident in the capabilities of their canines as well as the care given to their search partners as is presented in this report.

Canine Information

As with all 12 prior data reports[1-12], Labrador Retriever was the majority breed of search canine for the Camp Fire deployment. Belgian Malenois and German Shepherds are the most common breeds next on the list. Age and weight distributions, the majority being 5-8 years old and weighting 50-70 pounds (23-32 kg) respectively, remain similar among reports. Female spay was the majority gender unlike 8 prior deployments [1,2,4-7, 10-12], whereas female spay held a majority in only 2 reports. [3,10]. Signalment (age, gender, and breed) does not reflect on an individual canine's abilities in the field. Although this does reveal a tendency to favor female spayed Labrador Retrievers, all are subject to similar stringent certification standards which require recertification every 2-3 years.

Deployment Length

CSTs deployed an average of 5.4 days, 4 days being most common. Volunteer teams deploy as their schedules allow, and often redeploy at least once (17 teams deployed once, 11 teams deployed twice, 1 team deployed 3 times, and 1 team 4 times). Mutual aid teams all deployed once for 4-9 days. Team missions were staggered throughout the month of November as availability and needs assessment progressed.

Search Operations Shifts

Canines are exposed to weather, smoke, and the environment throughout their shift, plus search area hazards during active search. Work rest cycles are determined by handler based on these conditions to assure their canine is capable to work throughout their shift. The more athletically fit and the nicer the conditions, the longer a canine can search. Weather extremes, fatigue, physically challenging search areas, illness and injury require longer rest periods so search can continue throughout the mission period. CSTs worked an average of 4 shifts, with 2 shifts most commonly. Shifts ranged 3 to 14 hours, with 7-8 hours for most. Shifts are defined as the time a team signed in to the time they signed out of operations and include briefing, travel to and from search sites, safety evaluations, search time, and debriefing.

Command Centers, Bases of Operations

Initially operations were conducted by county LE based from a command center within the fire ravished Paradise area in a building without electricity running water. CSTs were largely self-sufficient. Amenities were added at the next CP outside the fire area at Butte College as operations continued. Once mutual aid teams were brought in, CPs and Bases of Operations with (BoOs) enlarged, established further away but with increasing support for extended mission capabilities. After the first week, transitions from living out of a personally owned vehicle (POV) to tents and buildings occurred, along with food, laundry, rest room and shower services for the search community.

Transport

With a large volunteer CST response, equipment and supplies are carried by the handler and POV transportation the most common mode of transportation. This ensures the handler and canine(s) have what they need to conduct search operations safely: personal protective equipment (PPE), water, food, first aid supplies, and a safe resting area.

Billeting

Hotels, tents (once established), and buildings were used for billeting. It is not uncommon for volunteer teams to use local hotels or POVs during deployments. Some were close enough to be able to travel back and forth from home or from their regular work bases. Proximity to CPs and BoOs is a consideration in time spent traveling. A good night's rest and good nutrition is important to maintain operational capability for both handlers and canines.

Hazmat and Safety

Hazmat and safety briefings maybe conducted before, during and after (debriefing) search operations. Additional intelligence gathered during operations can then be communicated at the start of each shift, via the daily operational action plan (OAP) or other forms of communication.

Several items on the list of Hazmat and safety issues presented are common across disasters, be they hurricanes, tornadoes, earthquakes, landslides, or flooding. This holds true for fire areas as well, but there are concerns unique to this type of search area. Extreme heat produces smoke that may contain poisonous and noxious gases. Ash and soot can mask holes; septic tank covers burn away (one canine fell through a septic tank cover), unstable surfaces, and sharp objects as well as cake like cement between canine toes, causing irritation, bruising, and lameness. It can hide smoldering roots that present a burn hazard, and cover dried caked blue-green antifreeze and battery acid residues around vehicles.

Modern concerns include narcotics and illegal drugs, an increasing concern in the United States. With respect to the Camp Fire, large communities of elderly persons were destroyed in the Camp Fire, leaving cardiac and respiratory drug residue hazards. Firearms and ammunitions are another increasing potential hazard during searches now.

Handlers reported receiving briefings, but of varied nature and detail. Communication is often challenging during disaster operations. The World Trade Center collapse on September 11, 2001 taught us the need to establish a common communication capability, conduct multi-agency training exercises, reach across agency and governmental borders to bring continuity and sharing of information to increase safety and accountability and operational awareness; streamline missions and document search results to decrease duplication and present current progress. Efforts to increase communications and effectively convey information remains a goal for future deployments.

Decontamination

Canine decontamination has evolved to become an expected area of operations during disasters. Individual unit designs have been documented and are publically available for any agency to add to their cache.[16,17]. National Guard units have allowed search canines into their decontamination tents at prior deployment (SR-530 Landslide, Oso, WA)[7,8], and this was the case at the Camp Fire. Handlers were also vigilant with decontamination during search operations, using baby wipes and towels.

Prior reports have brought to light 2 concerns. One is that repeated dishwashing liquid use, great for petroleum and oil-based contamination, will strip the canine coat of protective oils. This may lead to dry, irritated skin and scratching produces superficial abrasions with infection potential. Intermittent use of dog oatmeal shampoo and/or a conditional can prevent this. The other concern is not being able to completely dry the fur. Left damp, superficial dermatitis (also known as 'hot spot') can develop and quickly spread. Judicious fur clipping, antibiotics, and steroidal anti-inflammatories, topical and/or drugs given orally, are needed to control the infection. Fortunately only one of the 29 search canines developed such an infection, noticed during demobilization after 9 days deployed.

Medical Care

Two veterinary-based groups were present in some capacity. California Veterinary Medical Reserve Corps (CAVMRC) established a base veterinary treatment station at the Chico Airport, and a forward treatment station at the Tall Pines Bowling Alley in Paradise, CA. University of California, Davis School of Veterinary Medicine Veterinary Emergency Response Team (VERT) deployed resources to the forward areas to the Silver Dollar Fairgrounds in Chico, CA and forward operations areas. Both groups provided professional care for wounds and advice on 2 medical cases of concern.

Reserve Corps veterinarians are farm, equine, small, and exotic trained. In Oso, WA there were several opportunities for Just in Time (JIT) training about the nature of search canine care, what to look for, and how to approach. Proper bandaging was important so canines could maintain operational capability despite multiple paw issues[7,8], and attention to monitoring for dehydration were stressed.

The majority of canine medical checks were performed on a regular basis by the handlers. Pre-mission, pre-shift, shift, post-shift, and demobilization examinations are part of a handler's routine when deployed. The exams serve to not only check for and monitor injury and illness, but to discern a potential issue when it is early enough to treat it before becoming significant enough to prevent a canine from performing search.

K9 Injury

In this study, 50% (15/30) of the canines incurred injury, several had more than one. The majority were lacerations and abrasions. This is consistent with all prior canine injury and illness reports, including the Oklahoma Bombing[18] and The World Trade Center[19] disasters. All injuries were minor, treated and bandaged as needed, and none prevented any canine from continuing their search missions.

K9 Illness

One third (10/30) of the canines incurred illness. Weight loss, fatigue, and diarrhea are similar findings to other deployments, none serious enough to warrant demobilization or hospitalization. Extra food and extra meals are an easy solution to weight loss as long as the canine is eating well, and adjusting work-rest cycles can help with fatigue. An often over-looked reason for fatigue is no the work, but the rest – it may be the quality of the rest, not the quantity, as was discovered at the Oso, WA landslide[7,8]. Once a tent was set up with kennels, which separated the canines from constant heavy equipment noise and activity, their rest time was markedly more restful.

Of significance was the lack of dehydration issue. Dehydration may develop in any weather, not just heat. Factors include health of the canine, humidity, and work load. Weather varied over the month of November with temperatures ranging from 32°F-84°F (0°C- 29°C), averaging 44°F-70°F (7°C- 21°C), humidity ranging from 4%-100% and raining, and winds from 0-28 mph (0-45 kmph) [20]. (Rain seemed more of an issue with ash and soot caking between canine toes than any hypothermic concerns.)

Attention to canine hydration came to the forefront in several reports[1-3, 6-8]. Handler education and canine monitoring make a positive impact in prevention of issues noted from past experiences.

Other preventative measures mentioned were rinsing eyes, rinsing feet after exposure to ash to prevent abrasions, applying Musher's Secret to paw pads, giving Nutrical™ nutritional supplement during deployment, coats to help warm and dry the dogs quickly, Tuf-Foot spray on paws.

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Definitions for Reference

Mean = the average; the numbers are added and then divide by the number of numbers
Median = the middle value in the list of numbers
Mode = the value that occurs most often; if no number is repeated, there is no mode
Range = is the difference between the largest and smallest values

Survey Data Results

Data Collection

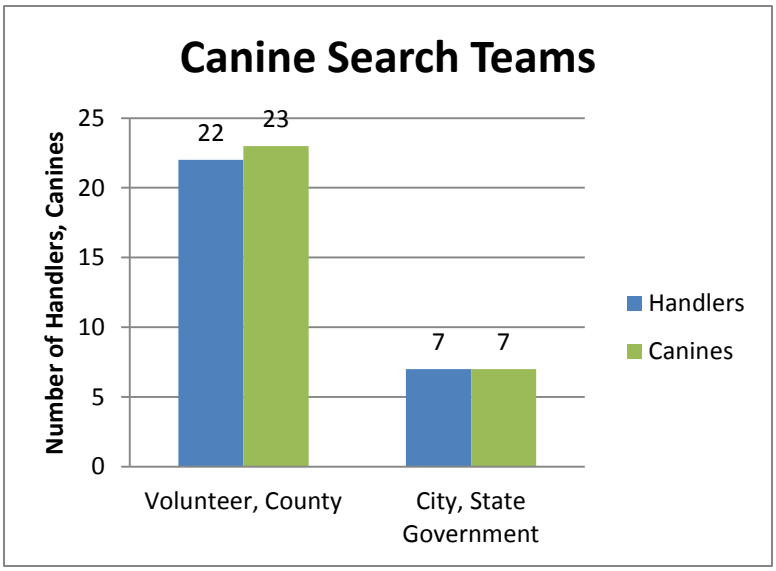
A survey was sent via electronic mail to 35 California-based Human Remains Detection Canine Search Teams (CST -HRD) deployed to the Camp Fire and tasked with canine search operations; 22 (for 23 canines) were received. Approximately 10 mutual aid CST assets from regional and national Task Forces were deployed; 7 surveys were received from these CST handlers.

Data collected from the questionnaire included handler deployment experience, canine signalment and search experience, deployment length, staging, transportation and billeting, hazmat and safety briefing, search operations shifts number and length, canine decontamination, canine medical care, canine injury and illness, and handler comments about their deployment.

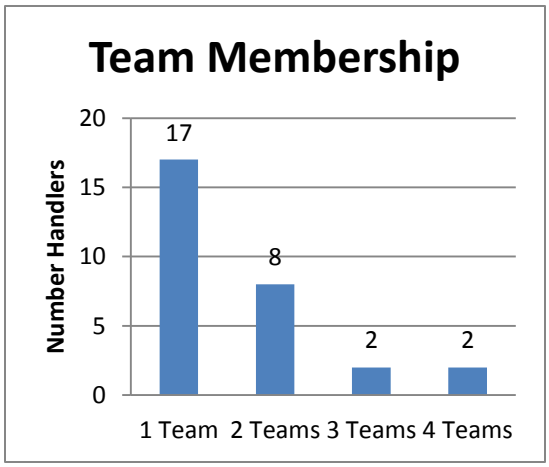
97% (28/29) surveys were returned less than a month (1-25 days) after demobilization and arrival back home; 1 survey was received at 46 days: mean 14 days, median 12 days, and mode of 10 days.

There were 30 canine surveys received from 29 handlers (one handler deployed with 2 canines). All data presented in this report is based on these 30 surveys.

- 76% (22/29) handlers with 77% (23/30) canines were Law Enforcement Division California-based volunteers and local California county-based teams
- 24% (7/29) Handlers with 23% (7/30) canines were mutual aid US&R assets from city and state governmental agencies



Handler Information



Team Affiliation

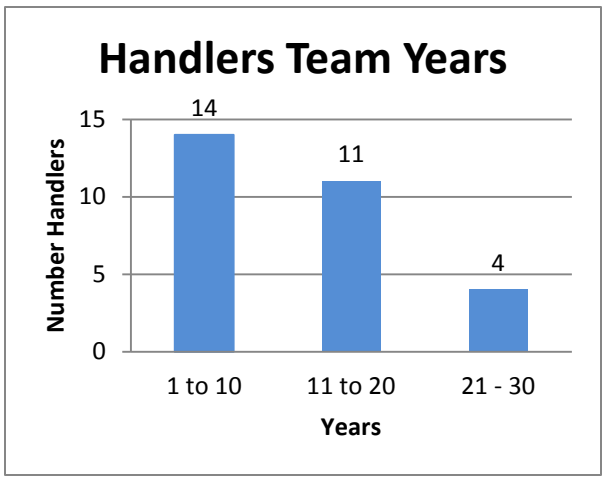
Many handlers were members of more than one search team, for a total of 46 teams reported.

- 59% (17/29) belonged to 1 team
- 28% (8/29) belonged to 2 teams
- 7% (2/29) belonged to 3 teams
- 7% (2/29) belonged to 4 teams

Handler years on teams

These 29 handlers had an accumulated total of 362 years with search teams. If a member of more than one team, the one a handler had the most years on was used in calculation of time experience.

- 48% (14/29) had 1 to 10 years with a search team
- 38% (11/29) had 11 to 20 years with a search team
- 14% (4/29) had 21 to 30 years with a search team
  - Mean 12.5 years
  - Median 11 years
  - Modes of 8, 12, and 23 years
  - Range 3 years to 23 years



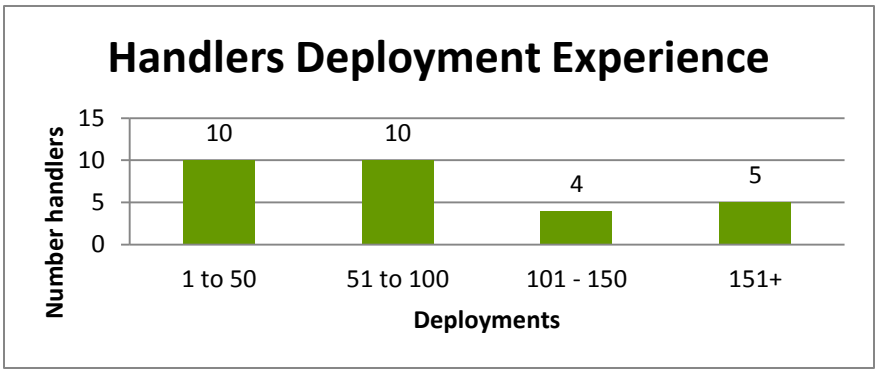
Handler Deployment Experience

Number of deployments reported ranged from 2 to 300.

- Mean of 78 deployments
- Median of 75 deployments
- Modes of both 40 and 100 deployments

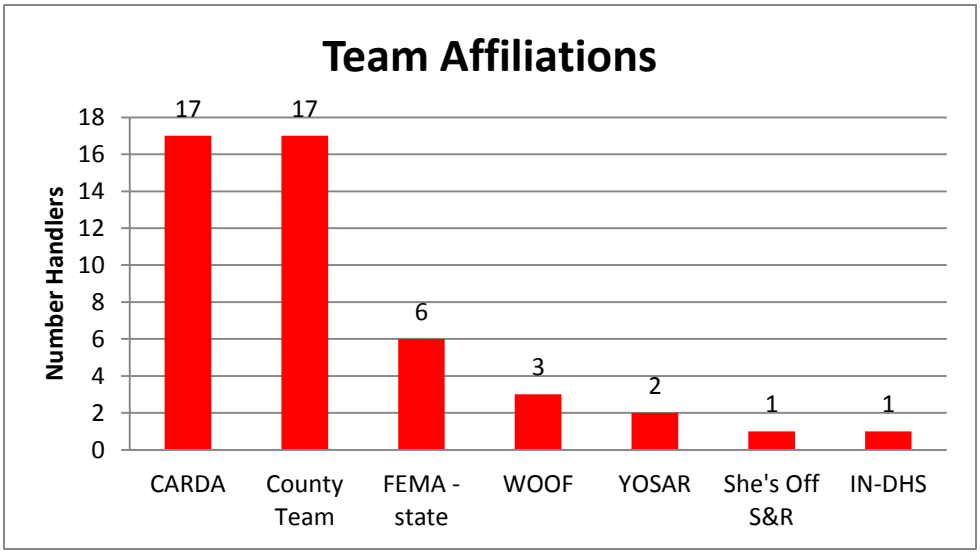
For 100% (29/29) of handlers this was not their first deployment. This was the first fire scene deployment for 4 handlers, and the first disaster deployment for 2.

- 34% (10/29) reported 1-50 deployments
- 34% (10/29) reported 51-100 deployments
- 14% (4/29) reported 101-150 deployments
- 17% (5/29) reported > 150 deployments



Handler membership for the 46 teams reported was as follows:

- 59% (17/29) California Rescue Dog Association (CARDA)
- 59% (17/29) County Teams
- 21% (6/29) Federal Emergency Management Agency (FEMA) Task Force – mutual aid state asset
- 10% (3/29) Wilderness Finders (WOOF)
- 7% (2/29 Yosemite Search and Rescue (YOSAR, 'YODOGS')
- 3% (1/29) She's Off Search & Rescue
- 3% (1/29) Indiana Department of Homeland Security (DHS)

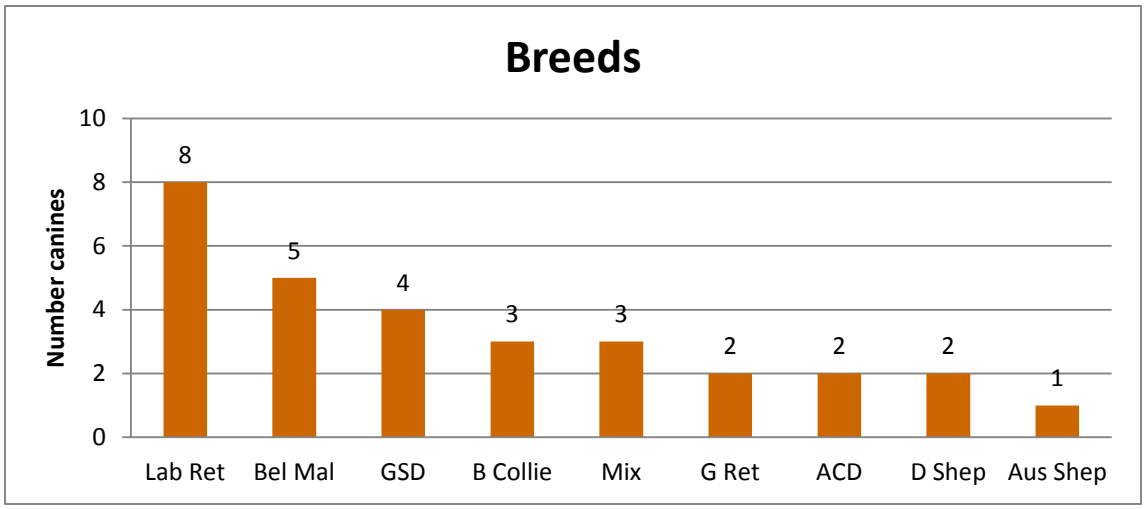


Canine Information

Signalment (breed, gender, age, weight)

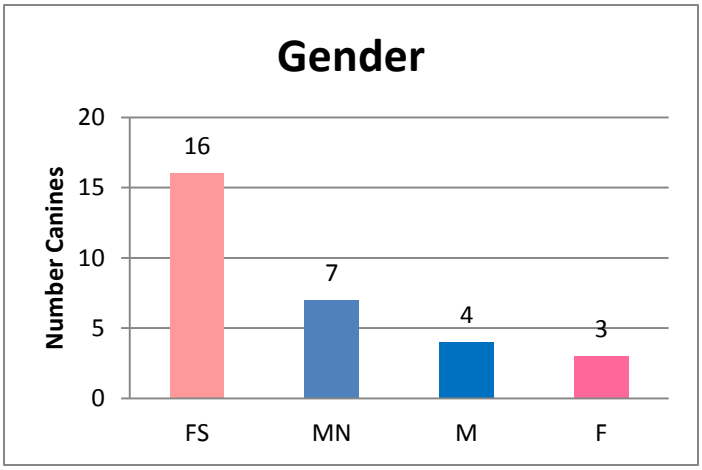
The 30 search canines in this survey represented 8 breeds; 3 were of mixed breeds.

- 27% (8/30) Labrador Retriever
- 17% (5/30) Belgian Malenois
- 13% (4/30) German Shepherd Dog (GSD)
- 10% (3/30) Border Collie
- 10% (3/30) mix (ACD, GSD, Lab mix)
- 7% (2/30) Golden Retriever
- 7% (2/30) Australian Cattle Dog (ACD)
- 7% (2/30) Dutch Shepherd
- 3% (1/30) Australian Shepherd



Gender distribution revealed a majority of spayed female canines.

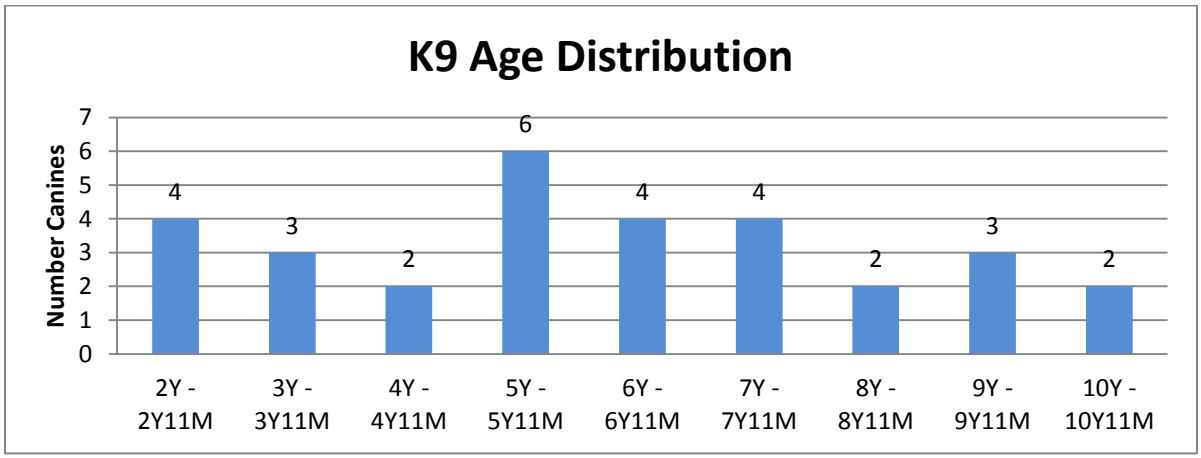
- 53% (16/30) Female Spay (FS)
- 23% (7/30) Male Neuter (MN)
- 13% (4/30) Male (M)
- 10% (3/30) Female (F)



Age

These canines accrued a total of 2,215 months (184 years, 7 months) of age among them.

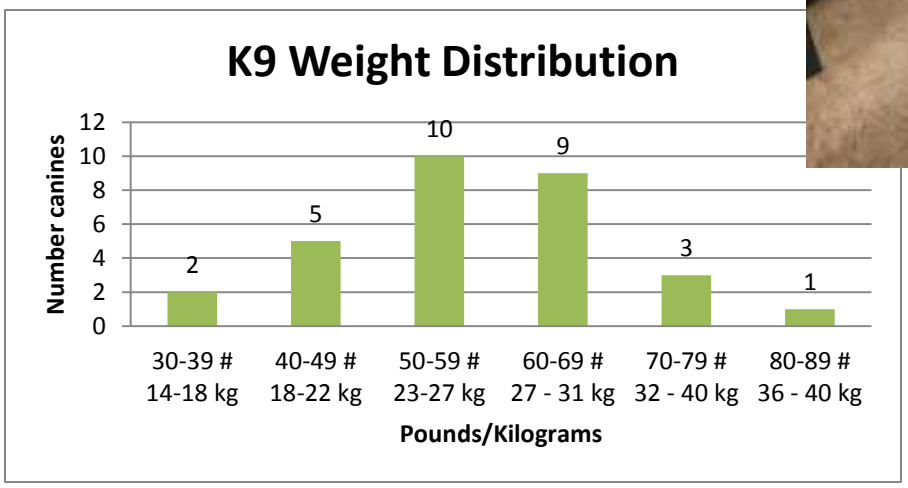
- Mean age 74 months (6 years, 2 months)
- Median age 69 months (5 years, 9 months)
- Mode was not represented; 47% (14/30) were between 5 and 8 years of age
- Range of age 29 to 130 months (2 years 5 months to 10 years 8 months)



Weight

Together these canines weighed in at a grand total of 1,694 pounds (770 kilograms)

- Mean weight 56.5 pounds (26 kg)
- Median weight 55.5 pounds (25 kg)
- Mode weight 65 pounds (30 kg)
- Range of weight 30 to 80 pounds (14-36 kg)



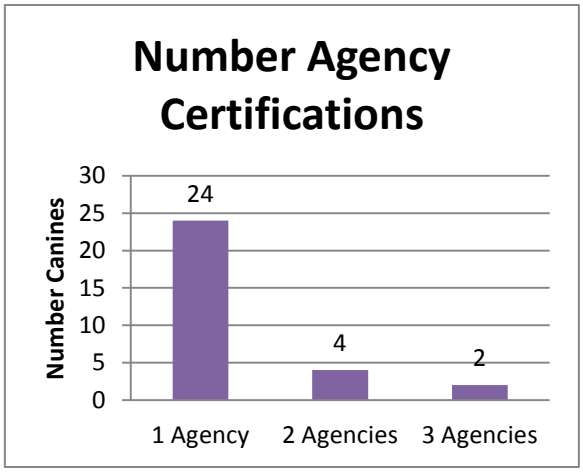
Canine Certifications

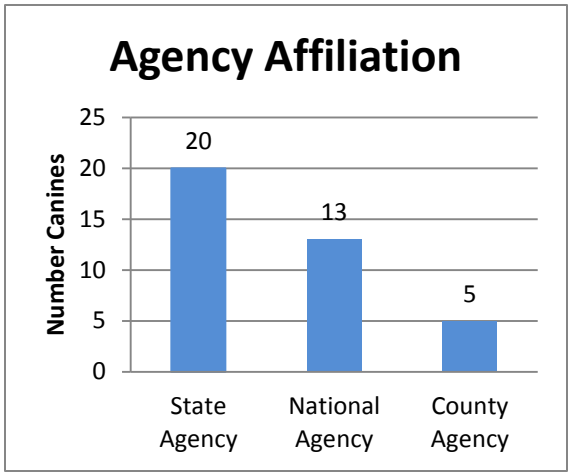
Several canines had certifications from more than one agency, for a total of 38 certifications.

- 80% (24/30) certified with 1 agency (24 certifications)
- 13% (4/30) certified with 2 agencies (8 certifications)
- 7% (2/30) certified with 3 agencies (6 certifications)

The 38 Human Remains Detection (HRD) certifications were from several organizations.

- 67% (20/30) certified by a state agency
- 43% (13/30) certified by a national agency
- 17% (5/30) certified by a county agency





Additional Certifications

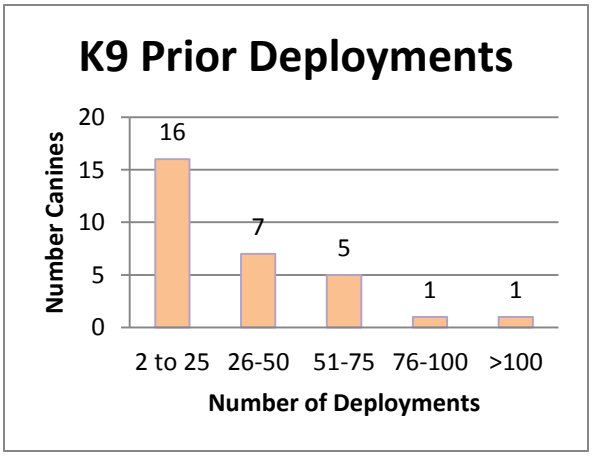
18 Canines were also certified in other disciplines.

- 23% (7/30) Trailing
- 10% (3/30) Live Find
- 10% (3/30) Water Recovery
- 7% (2/30) Firearms
- 3% (1/30) Disaster
- 3% (1/30) Air Scent
- 3% (1/30) Avalanche

Canine Deployment Experience

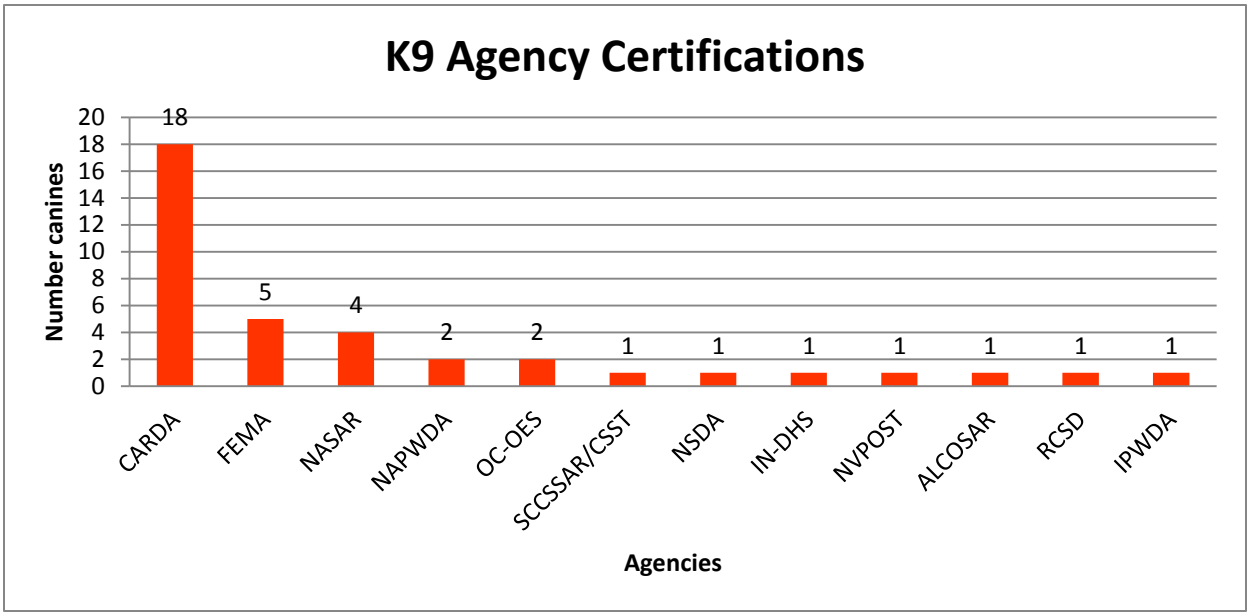
100% (29/29) canines had prior deployment experience. This was the first fire scene mission for 4 canines, the first large scale disaster mission for 2.

- 53% (16/30) 2-25 prior deployments
- 23% (7/30) 26-50 prior deployments
- 17% (5/30) 51-75 prior deployments
- 3% (1/30) 76-100 prior deployments
- 3% (1/30) >100 prior deployments



Certifying Agencies

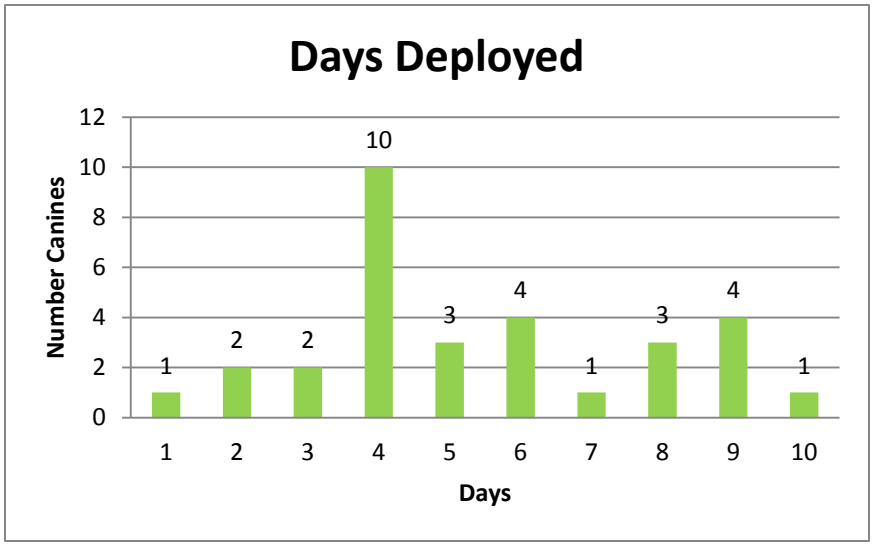
- 60% (18/30) California Rescue Dog Association (CARDA)
- 17% (5/30) Federal Emergency Management Agency (FEMA)
- 13% (4/30) National Association for Search and Rescue (NASAR)
- 7% (2/30) North American Police Working Dog Association (NAPWDA)
- 7% (2/30) Orange County Office of Emergency Service (OES)
- 3% (1/30) each:
  - Santa Clara County Sheriff's Search and Rescue/Canine Specialized Search Team (SCCSSAR/CSST)
  - National Search Dog Alliance (NSDA)
  - International Police Working Dog Association (IPWDA)
  - Indiana Department of Homeland Security (IN-DHS)
  - Nevada Peace officer Standards Training (NVPOST)
  - Almeda County Search and Rescue (ALCOSAR)
  - Riverside County Sheriff Department (RCSD)



Deployment Information

Together these 30 search canines accrued a total of 161 deployment days.

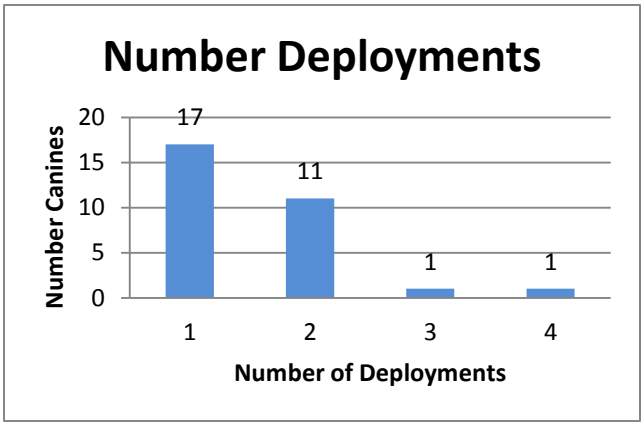
- 33% (10/30) deployed for total 4 days
- 13% (4/30) deployed for total 9 days
- 13% (4/30) deployed for total 6 days
- 10% (3/30) deployed for total 8 days
- 10% (3/30) deployed for total 5 days
- 7% (2/30) deployed for total 3 days
- 7% (2/30) deployed for total 2 days
- 3% (1/30) deployed for total 10 days
- 3% (1/30) deployed for total 7 days
- 3% (1/30) deployed for total 1 day



- Mean 5.4 days
- Median 4.5 days
- Mode 4 days
- Range 1 to 10 days

Some CST resources deployed more than once during the span of canine search operations. This was defined as a demobilization period of more than one day between deployments.

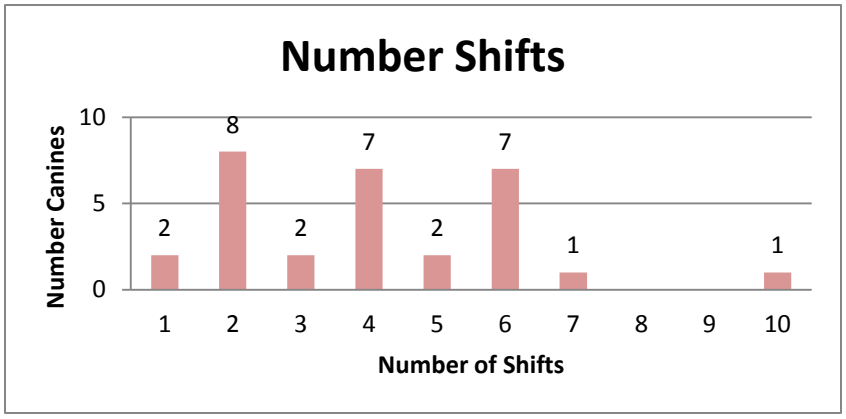
- 57% (17/30) deployed for a single span of day(s)
- 37% (11/30) deployed 2 times
- 3% (1/30) deployed 3 times
- 3% (1/30) deployed 4 times



Operational Search Shifts

Number of operational shifts in which all 30 search canines participated was 121 shifts. All operations were conducted during daylight.

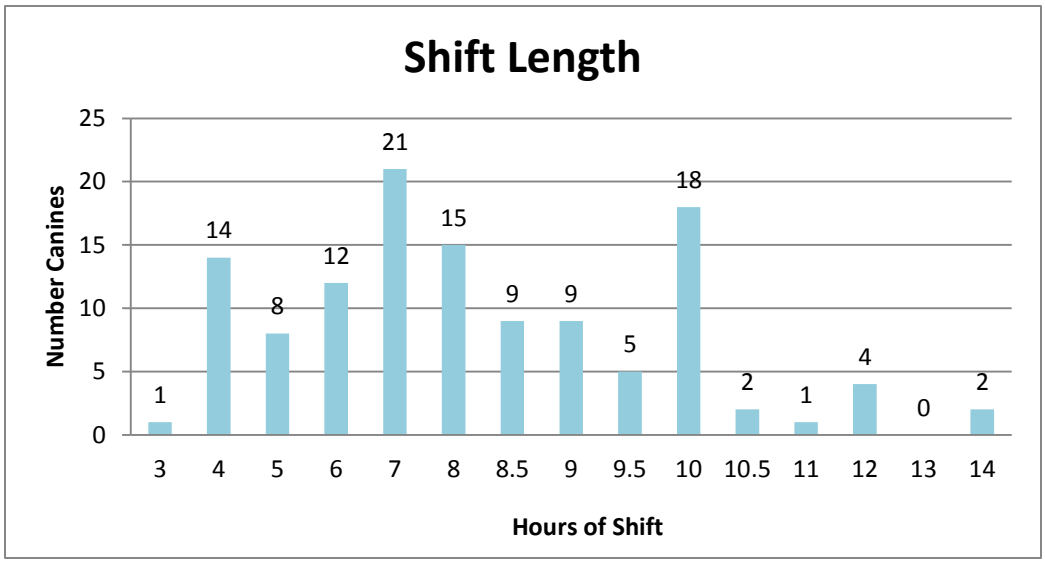
- 27% (8/30) operational for 2 shifts
- 23% (7/30) operational for 4 shifts
- 23% (7/30) operational for 6 shifts
- 7% (2/30) operational for 3 shifts
- 7% (2/30) operational for 5 shifts
- 7% (2/30) operational for 1 shift
- 3% (1/30) operational for 7 shifts
- 3% (1/30) operational for 10 shifts



- Mean of 4 shifts
- Median of 4 shifts
- Mode of 2 shifts
- Range 1 to 10 shifts

Length of the 121 shifts varied. The canines were part of a total 931 shift hours.

- 17% (21/121) were 7 hours long
- 15% (18/121) were 10 hours long
- 12% (14/121) were 4 hours long
- 12% (15/121) were 8 hours long
- 10% (12/121) were 6 hours long
- 7% (9/121) were 8.5 hours long
- 7% (9/121) were 9 hours long
- 7% (8/121) were 5 hours long
- 4% (5/121) were 9.5 hours long
- 3% (4/121) were 12 hours long
- 2% (2/121) were 10.5 hours long
- 2% (2/121) were 14 hours long
- 1% (1/121) were 3 hours long
- 1% (1/121) were 11 hours long



Mean 7.7 hrs
Median 8 hrs
Mode 7 hrs
Range 3-14 hrs

Command Centers and Bases of Operations

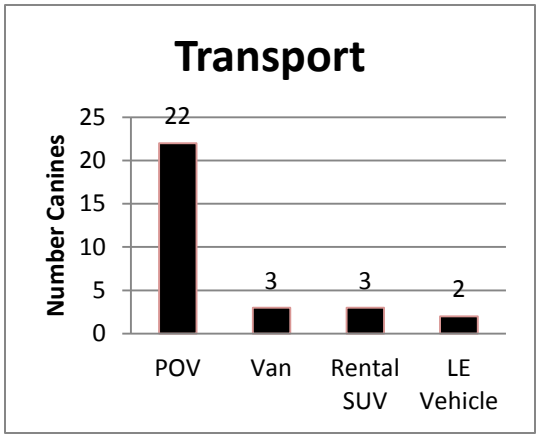
Butte County Sheriff's Department directed initial operations from a command (CP) post set up in the abandoned Tall Pines Bowling Alley, Paradise, CA. Another Command Post (CP) was established just outside the fire area at Butte College, Oroville, CA where trailers, food, and portable restroom facilities were stationed.

California Fire and Rescue Teams were brought in under California State Law Enforcement Mutual Aid System, establishing Base of Operations (BoO) at a park, Thermalito Forebay North Picnic Area, in Oroville, CA. Tent shelters were erected and food, shower, laundry, and rest room facilities established. These operations were relocated to the Silver Dollar Fairgrounds in Chico, CA.

Transport

Transportation to and from deployment and mission sites was reported as follows:

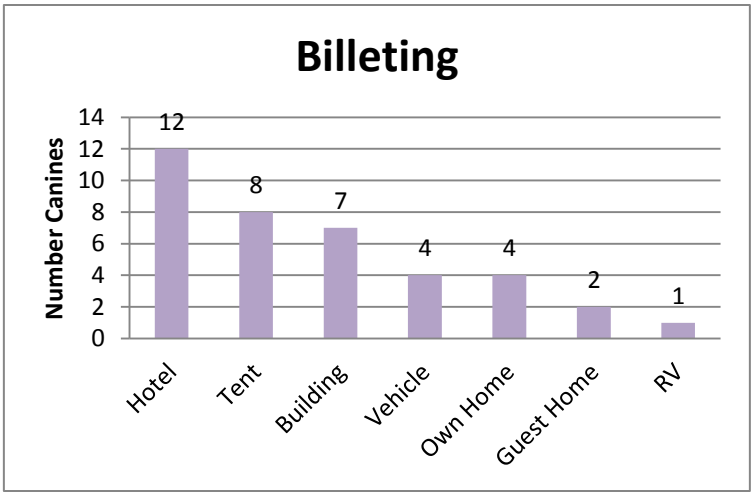
- 73% (22/30) Personally Owned Vehicles (POVs)
- 10% (3/30) Vans
- 10% (3/30) Rental Sport Utility Vehicle (SUV)
- 7% (2/30) Law Enforcement (LE) department or command vehicle



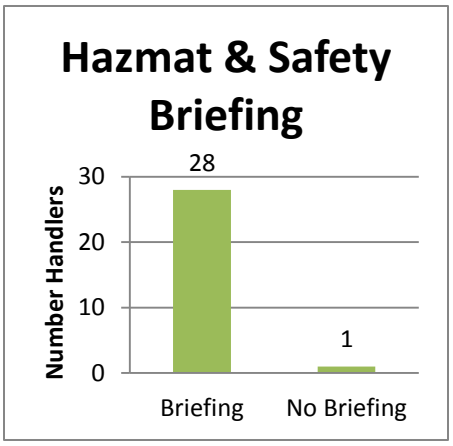
Billeting

Sleeping quarters varied as well as amenities available at these sites. As the deployment progressed services were acquired in some areas.

- 40% (12/30) Hotel
- 27% (8/30) Tent
- 23% (7/30) Building
- 13% (4/30) Vehicle
- 13% (4/30) Own home
- 7% (2/30) Guest at a home
- 3% (1/30) Recreational Vehicle (RV)
  - 83% (25/30) stayed same place
  - 17% (5/30) stayed multiple places



Hazmat and Safety



Briefings for hazmat and safety conducted varied in content.

- 97% (28/29) Handlers received briefings
- 3% (1/29) Reported they did not
- 3 Comments: limited, not in depth, or not K9 specific.

Air quality – carcinogenic respiratory hazards from woodland, building, vehicle smoke
Carbon monoxide and other off gases
Ash/soot dry – inhalation, absorption, and digestion hazard
Ash/soot wet – cakes and lodges between toes, skin irritation
Basements – chemical/electrical, unstable floor/ceiling hazard
Glass/mirrors broken – laceration injury hazard
Burning roots/hot spots – burn hazard
Charred foodstuffs – absorption and ingestion hazard
Chemicals, Poisons (household, lawn and garden) - absorption and ingestion hazard
Contaminated water/rain water – absorption, ingestion hazard
Dehydration – medical hazard
Drywall mud – sticky, lodges on paws, irritation
Holes – hidden under ash, injury hazard
Human remains - absorption and ingestion hazard
Masonry – chimneys, fireplaces unstable; injury
Metal – sharp edges injury hazard
Mudslides – injury, life-threatening hazard
Nails – puncture injury hazard
Pools – drowning victims; injury hazard
Power lines – assume active until checked
Septic tanks – covers gone/hidden holes
Uneven ground – injury hazard
Weather – medical hazard
Widowmaker trees – injury hazard

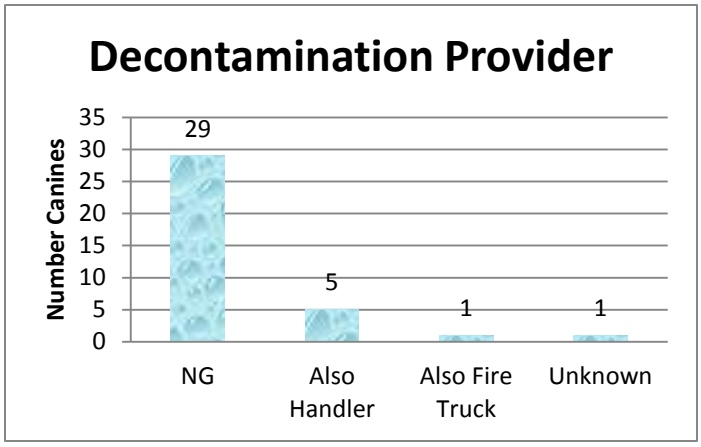
Concerns not listed:
Anti-freeze/battery acid residue from cars
Drugs -narcotic, cardiac and respiratory
Propane tanks
Firearms and ammunition
Poison oak smoke – contact and inhalation
Fire Retardant – unknown safety concern

Decontamination

Stations

All handlers reported the presence of decontamination operations. 100% (30/30) canines went through decontamination procedures provided by the following.

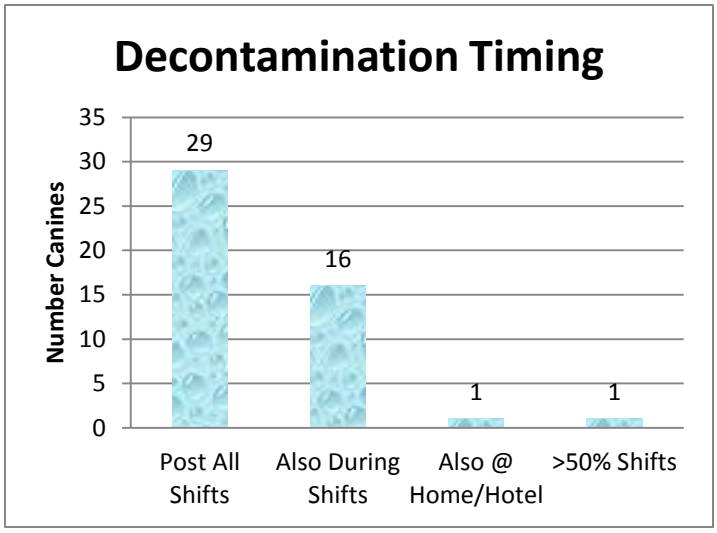
- 97% (29/30) by National Guard (NG) station
- 17% (5/30) also by handler
- 3% (1/30) also by fire trucks
- 3% (1/30) handler reported as unknown (likely NG)



Timing

Decontamination was performed for all canines. Many received it multiple times during shift. During shifts baby wipes and water rinsing was performed. NG used a contained area with warm water, soap, towel drying. Driers or warmed areas were available for some as well.

- 97% (29/30) after every shift
- 53% (16/30) also during shift
- 3% (1/30) also at home or hotel
- 3% (1/30) after >50% of their shifts



Canine Medical Care

Veterinary Services

California Veterinary Medical Reserve Corps (CAVMRC) established a base veterinary treatment station at the Chico Airport, and a forward treatment station at the Tall Pines Bowling Alley in Paradise, CA.

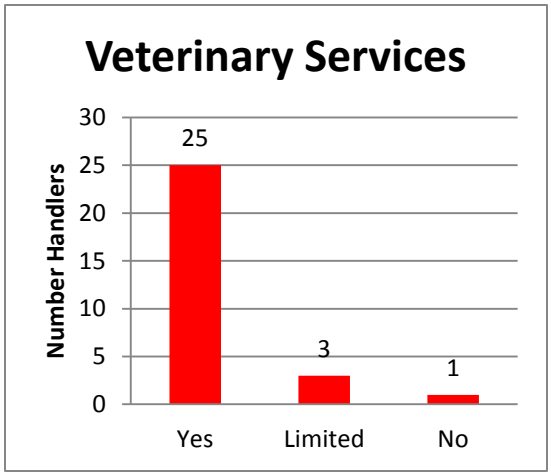
University of California, Davis School of Veterinary Medicine Veterinary Emergency Response Team (VERT) deployed resources to the forward areas to the Silver Dollar Fairgrounds in Chico, CA and forward operations areas.

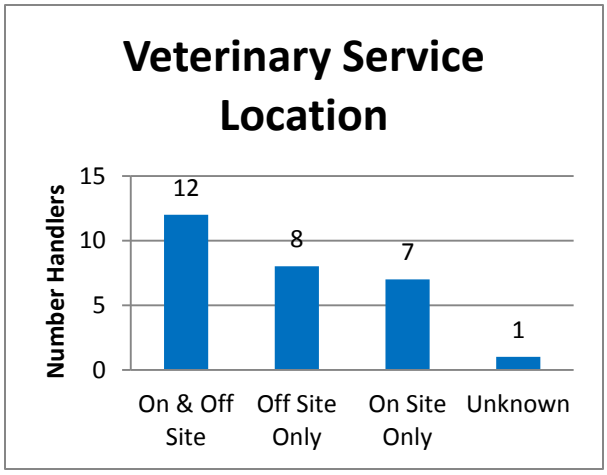
Veterinary services available for search dogs during deployment were reported by the 29 handlers as follows.

- 86% (25/29) yes, veterinary services available
- 10% (3/29) yes, limited
- 3 % (1/29) not available

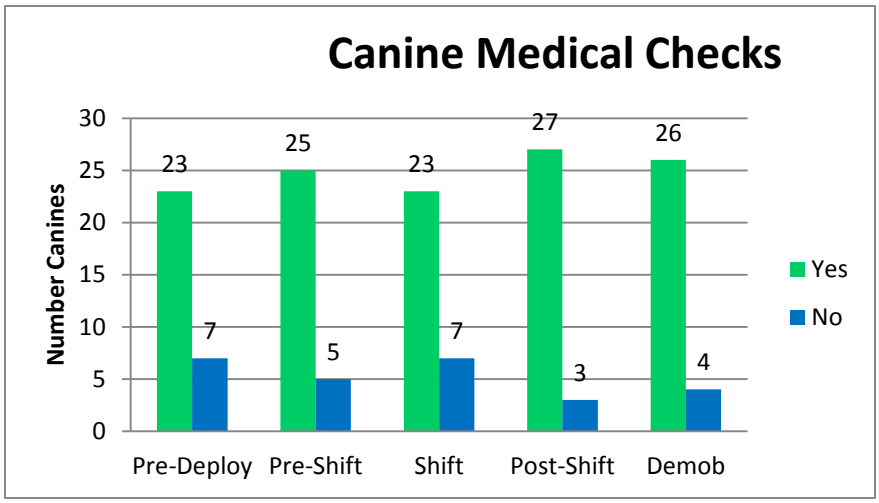
Of the 28 handlers who responded yes, veterinary services were available and/or utilized as follows.

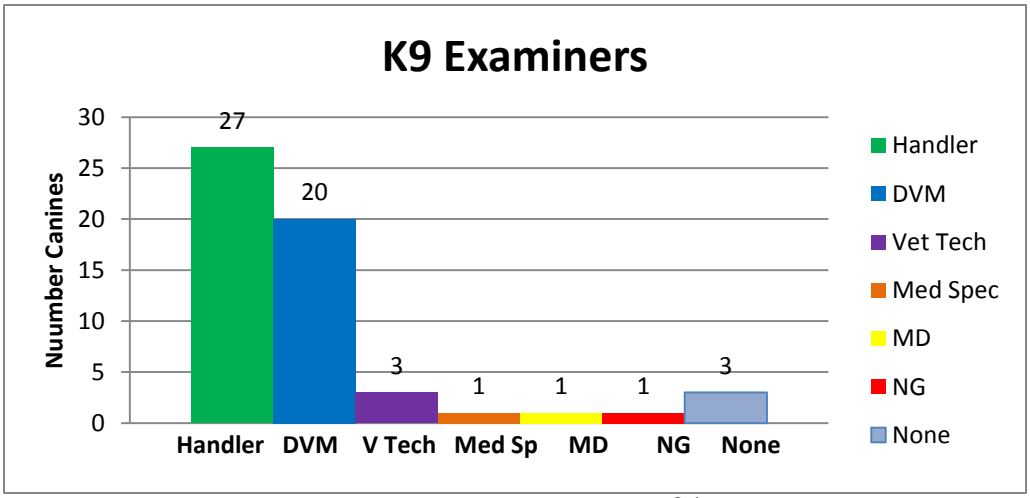
- 43% (12/28) had them on and off site
- 29% (8/28) off site only
- 25% (7/28) on site only
- 4% (1/28) responded unknown (did not need/use DVM services)



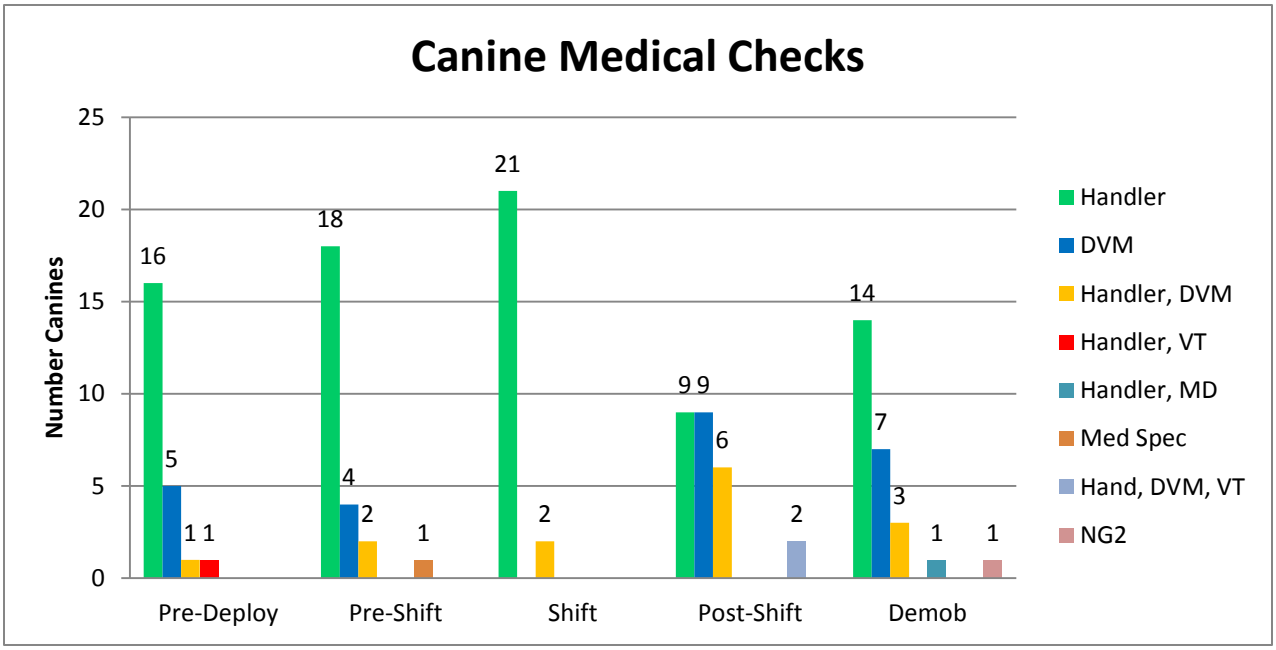


Canine (30 of them) Examinations			Examiner
Pre-Deployment:	77% (23/30) Yes	23% (7/30) No	70% (16/23) Handler 22% (5/23) DVM 4 % (1/23) Handler, DVM 4% (1/23) Handler, VT
Pre-Shift:	83% (25/30) Yes	17% (5/30) No	72% (18/25) Handler 16% (4/25) DVM 8% (2/25) Handler, DVM 4% (1/25) Med Specialist
During Shift:	77% (23/30) Yes	23% (7/30) No	91% (21/23) Handler 9% (2/23) Handler, DVM
Post-Shift:	90% (27/30) Yes	10% (3/30) No	33% (9/27) DVM 33% (9/27) Handler 22% (6/27) Handler, DVM 7% (2/27) Hand, DVM, VT
Demobilization:	87% (26/30) Yes	13% (4/30) No	54% (14/26) Handler 27% (7/26) DVM 12% (3/26) Handler, DVM 4% (1/26) Handler, MD 4% (1/26) National Guard

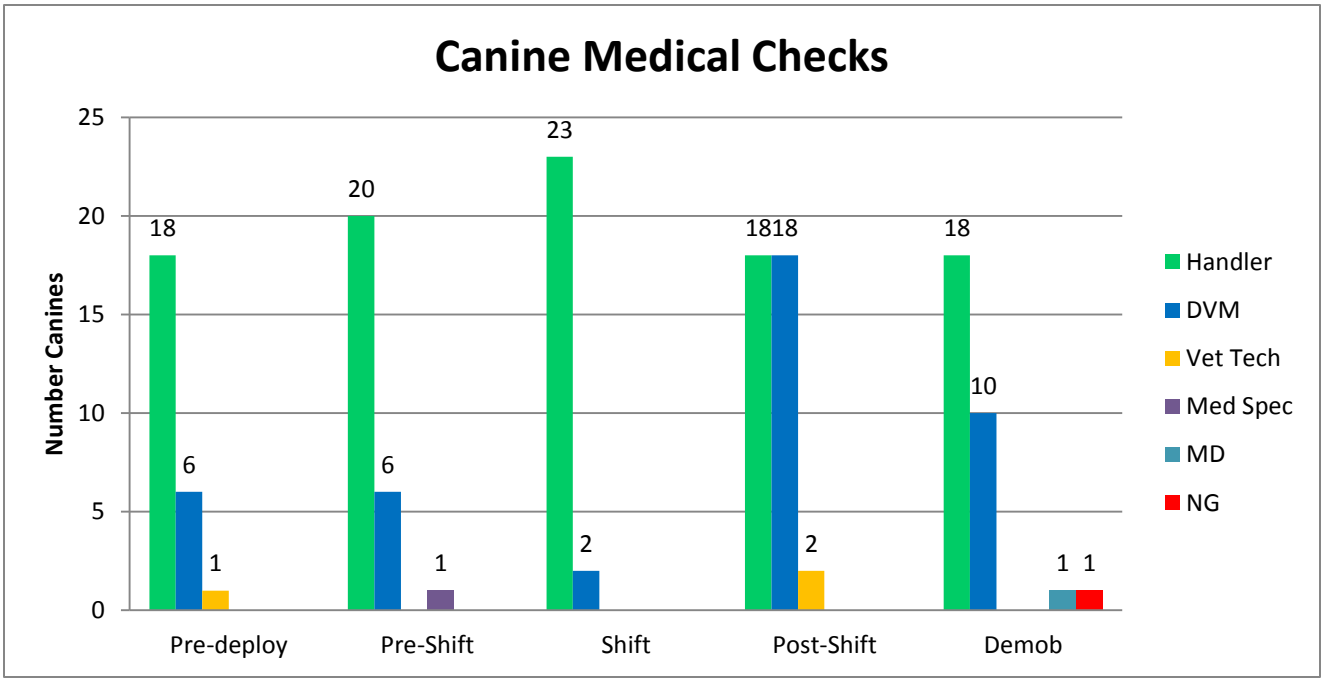




Handlers performed the majority of canine examinations throughout their deployment. Veterinarians also played a significant role in responding to injury and illness situations.



This chart divides exams as given each canine per time division, some having exams done by more than one resource in a designated time frame.

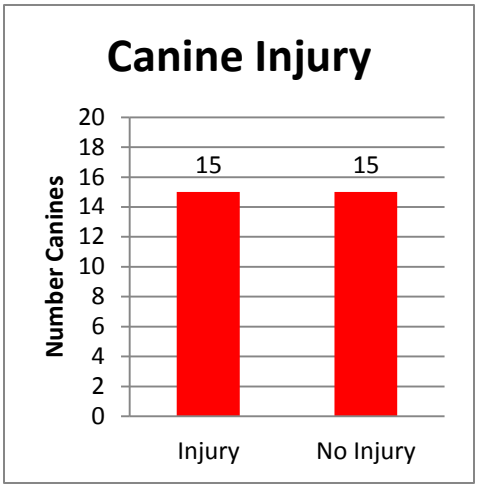


This chart divides exams as experienced for each canine based on the resource.

Canine Injury

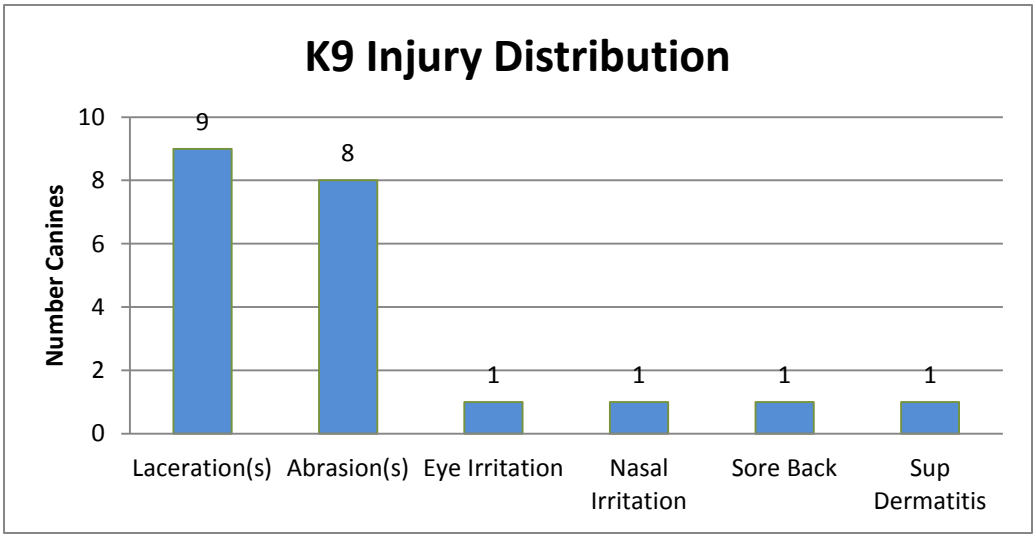
Canine injury incurred during their deployment was reported per handler account.

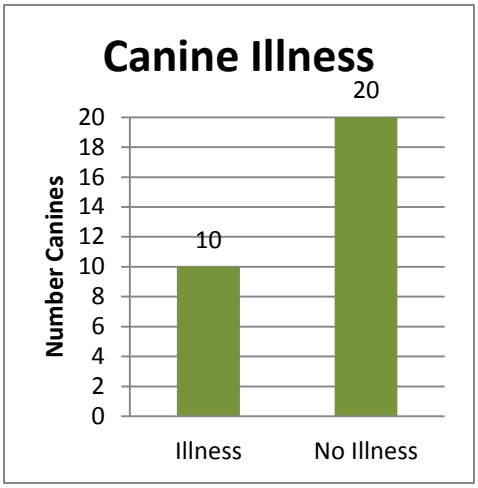
- 50% (15/30) canines were injured
- 50% (15/30) canines had no injuries



Injuries were as follows:

- 60% (9/15) Lacerations
- 53% (8/15) Abrasion(s)
- 7% (1/15) Ocular irritation
- 7% (1/15) Nasal irritation/contact dermatitis
- 7% (1/15) Sore back
- 7% (1/15) Superficial dermatitis ('hot spot')





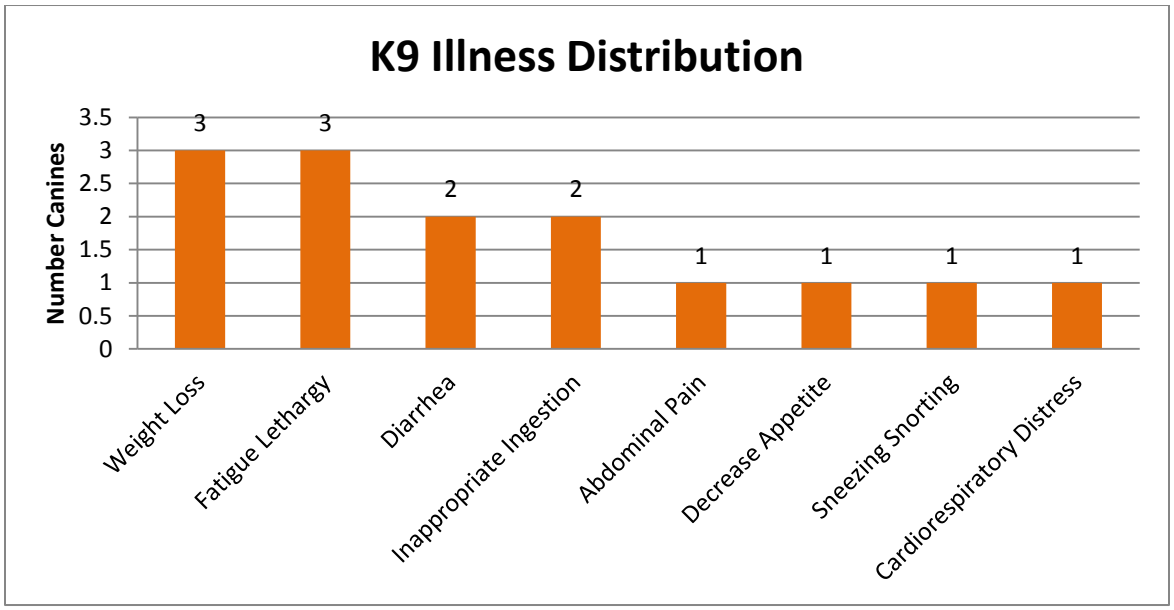
Canine Illness

Canine illness incurred during their deployment was reported per handler account.

- 33% (10/30) canines were injured
- 67% (20/30) canines had no injuries

Illnesses were as follows.

- 30% (3/10) Weight loss
- 30% (3/10) Lethargy/fatigue
- 20% (2/10) Diarrhea
- 20% (2/10) Ingestion (ash, unknown substance)
- 10% (1/10) Abdominal tenderness,
- 10% (1/10) Appetite decrease
- 10% (1/10) Intense sneezing, snorting
- 10% (1/10) Cardiorespiratory distress



Medical Treatments

Injuries were cared for with a combination of any of the following treatments: clipping, cleaning, topical antibiotics, bandaging, suturing, stapling, skin glue, oral antibiotics, oral anti-inflammatories, and oral narcotics. Most wounds were healed or healing well during and after the deployment.

Illnesses were treated with the following: increasing food intake for weight loss, additional rest and relaxation for fatigue, extra water intake and GI health supplements for diarrheas, activated charcoal orally for dietary indiscretion, observation only for extensive sneezing/snorting, blood work and ultrasound for abdominal pain. All canines were doing well soon after their deployment.

Thank you

I so appreciate the opportunity to report on the canines who deployed for the California Camp Fire search mission. Thanks to all the handlers who took time out of their busy schedules to answer the survey and all my follow-up questions.

Abbreviations

AAR – After Action Report
ACD – Australian Cattle Dog
ALCOSAR - Almeda County Search and Rescue
BoO – Base of Operations
CAVMRC - California Veterinary Medical Reserve Corps
CARDA – California Rescue Dog Association
CP – Command Post
CST-HRD – Canine Search Team – Human Remains Detection
DHS – Department of Homeland Security
DVM – Doctor of Veterinary Medicine
F - Female
FEMA – Federal Emergency Management Agency
FS – Female spay; dog cannot birth puppies
GSD – German Shepherd Dog
Hazmat – Hazardous Material
HRD – Human Remains Detection
IAP – Incident Action Plan
JIT – Just in Time (Training)
K9 – Canine
LE – Law Enforcement
LF – Live Find
M - Male
MD – Medical Doctor
MN – Male, neuter; cannot sire puppies
MRP – Mission Ready Package
NAPWDA - North American Police Working Dog Association
NASAR - National Association for Search and Rescue
NG – National Guard
NIMS - National Incident Management System
NSDA - National Search Dog Alliance
NVPOST - Nevada Peace officer Standards Training
OAP - Operational Action Plan
OC-OES - Orange County Office of Emergency Services
OES - Office of Emergency Services
PE – Physical Examination
PPE – Personal Protective Equipment
POV – Personally Owned Vehicle
RCSD - Riverside County Sheriff Department
RV - Recreational Vehicle

SAR – Search and Rescue
SCCSSAR/CSST - Santa Clara County Sheriff's Search and Rescue/Canine Specialized Search Team
SUV – Sport Utility Vehicle
TF – Task Force
US&R – Urban Search and Rescue
VERT - Veterinary Emergency Response Team
VT – Veterinary technician
WNL – Within Normal Limits
WOOF - Wilderness Finders
YOSAR ('YODOGS') – Yosemite Search and Rescue

Weather History – Chico, CA[20]

Daily Observations

Time	Temperature (° F)			Dew Point (° F)			Humidity (%)			Wind Speed (mph)			
Nov	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max
1	84	70	55	43	40	36	58	-	18	14	-	0	30.18
2	80	66	51	41	39	37	62	-	21	12	-	0	30.2
3	84	68	53	37	23	10	51	-	6	20	-	0	30.14
4	75	64	53	39	27	19	38	-	20	10	-	0	30.04
5	77	64	50	34	23	5	54	-	7	24	-	4	29.98
6	77	60	44	46	14	0	41	-	5	20	-	0	30.02
7	75	58	41	18	8	-9	36	-	4	17	-	0	30.1
8	71	55	39	10	5	0	31	-	6	25	-	0	30.22
9	48	44	39	14	7	0	36	-	15	7	-	0	30.19
10	66	49	32	25	14	9	48	-	11	7	-	0	30.12
11	68	52	35	14	8	1	36	-	7	18	-	0	30.25
12	60	48	35	19	9	1	35	-	12	7	-	0	30.38
13	55	46	37	23	16	9	45	-	23	9	-	0	30.46
14	57	44	32	19	17	14	55	-	21	7	-	0	30.4
15	55	45	35	30	21	18	56	-	28	6	-	0	30.24
16	60	46	33	27	21	18	60	-	20	5	-	0	30.1
17	62	48	33	27	21	18	60	-	20	7	-	0	30.07
18	64	48	33	27	23	19	60	-	21	7	-	0	30.14
19	66	49	32	28	23	19	69	-	17	8	-	0	30.1
20	62	47	32	27	22	19	69	-	22	8	-	0	30.05
21	55	48	41	55	39	19	100	-	32	21	-	0	30.03
22	57	54	50	54	51	46	100	-	67	28	-	6	30.15
23	55	52	50	55	52	50	100	-	88	23	-	0	30.16
24	62	54	46	57	52	45	100	-	52	18	-	0	30.06
25	64	53	42	50	46	41	100	-	42	8	-	0	30.16
26	59	50	42	48	45	41	100	-	59	7	-	0	30.23
27	55	50	46	55	51	46	100	-	93	18	-	0	30.12
28	60	56	53	55	54	52	100	-	72	18	-	0	29.97
29	55	50	44	54	50	45	100	-	77	31	-	0	29.77
30	55	47	39	48	43	37	100	-	62	12	-	0	30.06

Photographic Credits

Cover Page – Handler Eric Darling, K9 Wyatt: house search
Page 1 – Handler Marion Matthews, K9 Marach: vehicle search
Page 2 – Handler Eric Darling, K9 Wyatt: house search
Page 3 – NANSA Earth Observatory - https://earthobservatory.nasa.gov/images/144225/camp-fire-rages-in-california
Page 4 – Handler Anne Goldsmith, treatment services
Page 5 – Handler Marion Matthews, K9 Marach: PPE, search conditions
Page 6 – Handler Eric Darling, K9 Wyatt: rain search conditions
Page 7 – Ammunition safes: bulging from explosions within. Courtesy Dr. Ben Ho
Page 8 – National Guard decontamination entrance. Courtesy Handler M. Wendels
Page 8 – Handler Martin Wendels, K9 Max: Decontamination
Page 8 – Superficial Dermatitis on neck; Courtesy Handler E. Darling
Page 9 – K9 Roxie paw pad laceration suturing. Courtesy Handler A. Goldsmith
Page 9 – K9 Ghost paw pad wound treatment; Courtesy handler K. Lundquist
Page 9 – K9 Wyatt digital abrasion. Courtesy Handler E. Darling
Page 10 – K9 Wyatt: search operations. Courtesy Handler E. Darling
Page 11 – Handler Marion Matthews, K9 Marach: search operations
Page 12 – Handler Martin Wendels, K9 Max: building search
Page 14 – Handler Lynn Potts, K9 K.C.: search operations
Page 15 – Handler Kevin Lundquist, K9 Ghost: injury treatment
Page 18 – Handler Tim Houweling, K9 George: house search
Page 20 – Damaged building search mission. Courtesy Handler M. Matthews
Page 21 – Handler Eric Darling, K9 Wyatt: basement search
Page 21 – Melted shotguns and rifles. Courtesy of Dr. Ben Ho
Page 22 – Handlers Marion Matthews, Shay Cook; K9s Marach and Zinka: NG decontamination
Page 22 – Handler Martin Wendels, K9 Max: decontamination
Page 23 – Handler Anne Goldsmith, K9 Roxie: injury treatment
Page 24 - Handler Tim Houweling, K9 George: laceration injury
Page 26 – K9 Wyatt: pad laceration; Courtesy Handler E. Darling
Page 26 – K9 George: metacarpal abrasions. Courtesy Handler T. Houweling
Page 26 – K9 Ghost: blood from pad laceration. Courtesy Handler K. Lundquist
Page 27 – Handler Eric Darling, K9 Wyatt: encouragement, long day
Page 27 – K9 Max: rest time. Courtesy Handler M. Wendels
Page 28 – K9 Spinner during search operations; courtesy Handler N. Francis
Page 28 – Handler Lori Gordon, DVM with K9 Davner
Page 35 – Wolf Hollow veterinarian Dr. Gordon, wolf puppy Askulee; Courtesy Stephen Canino
Page 36 – Dr. Ben Ho with FEMA certified K9 partner Argus

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Lori E. Gordon, DVM

Dr. Gordon graduated from Kansas State University College of Veterinary Medicine in 1989, completing an internship in Small Animal Medicine and Surgery, and a residency in Small Animal Surgery over the next 4 years. She deployed with Veterinary Medical Assistance Team-1 (VMAT-1) to the World Trade Center, which began her second career of caring for search canines on deployment. In addition to owning Veterinary Surgical Care, Inc. she currently is a Veterinary Officer with the National Veterinary Response Team-1 (NVRT-1), Massachusetts Task Force-1 (MA-TF1) Urban Search & Rescue, and Federal Emergency Management Agency (FEMA) Incident Support Team (IST). With FEMA and MA-TF1 she has deployed to Hurricanes Hannah, Gustav and Ike, Irene, and Sandy; SR-530 Oso, WA Landslide, Hurricanes Matthew, Irma, Maria, Florence, and Michael.

March 2019 will be her seventh year as a veterinarian for the Iditarod race in Alaska. An advocate for the humane treatment and conservation of all animals, wolves are a special passion and she cares for the wolf packs at Wolf Hollow in Ipswich, MA, a non-profit educational facility purposed to inform the public on the truth about wolves and their place in maintaining nature's balance and well-being.

Davner, IPWDA (International Police Working Dog Association) and NSDA (National Search Dog Alliance)-certified human remains detection search canine, also travels with Dr. Gordon as a demonstration dog to help teach human medics about the care of search canines in the field. MA-TF1 US&R supports her web site www.usarveterinarygroup.org, providing guidelines for search canine care, decontamination, and deployment data.

Ben Ho, M.D. CAPT, MC, USN, Ret.

Dr. Ho is a retired U.S. Navy Captain surgeon with over 20 years of active duty, including tours of Southeast Asia, Africa, the Mideast, and the South Pacific. He is a Gulf War Veteran.

Dr. Ho is a member of the FEMA Oakland Urban Search and Rescue Task Force (CATF4) and has participated in operations during the Loma Prieta earthquake, the Oakland Hills firestorm, Hurricane Iniki, the Los Angeles earthquake, the Oklahoma City bombing, the World Trade Center disaster, Hurricanes Katrina, Rita, and Harvey, the Santa Rosa fires, and the Montecito Mudslide.

Dr. Ho has certified as a FEMA Type 1 Disaster Canine Handler. Ben is additionally qualified as a Task Force Leader, Search Team Manager, Search and Recon Technician, and Medical Team member. He is an instructor in Confined Space Medicine, Land Navigation, K9 Scent Behavior, and Child Abduction Homicide.

Dr. Ho has been a Reserve Police Officer in California for 37 years and is an instructor in firearms, the patrol assault rifle, and the PR 24 baton. He is actively involved in backcountry rescue with Wilderness Finders Search and Rescue Dog Teams from Lake Tahoe and has certified as a California Type 1 Wilderness Search Dog Team. He currently is the Law Enforcement Canine Coordinator for the State of California Office of Emergency Services.

Disclaimer

The opinions expressed in this report are the authors' own and do not necessarily represent the views of the California Office of Emergency Services or the Massachusetts Task Force 1.