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Historic Human Remains Detection Dog's: Use and Application for Unmarked Graves Searches.

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Introduction

Historic Human Remains Detection Dogs (HHRDD's) are emerging as a significant tool to help Nations searching for unmarked graves in residential landscapes. This document aims to provide some basic information regarding the types of detection dogs, what they do, and provide recommendations for Nations who are looking to bring these dogs into their communities. The following is based on publicly available information and information provided by Dr. Sarah Beaulieu in her presentation "Historic Human Remains Detection Dogs: Contributing to The Search for the Missing Children", as recorded by the National Advisory Committee on Residential Schools Missing Children and Unmarked Burials webinar "[Beyond Ground Penetrating Radar](#)", which is available on Youtube.

Types of Detection Dogs

There are a few different types of Detection Dogs that are used in police work, missing persons cases, and disaster recovery situations. It is possible for dogs to be cross-trained in more than one of these areas. These include:

Search Dogs:

- **Live Searches:** trained on scents remaining in the air after a living person goes missing.

Detection Dogs:

- **Human Remains Detection Dogs:** focused on the scent of decomposition odor in or near the ground of recently deceased individuals, trained to ignore other scents such as animal remains.
- **Historic Human Remains Detection Dogs:** focused on the scent of decomposition odor in or near the ground of older human remains, trained to ignore other scents such as animal remains.
- **Cremaains Detection Dogs:** trained to detect burnt human remains or ash in the absence of other human traces.

How Do They Search?

Historic Human Remains Detection Dogs are specifically trained to locate older human remains, and have been used in the United States and in Europe to identify graves in archaeological and historic contexts (dating back 9,000 years in some cases), with studies published on their efficacy and accuracy. More recently, they have been used in conjunction with geophysical techniques such as GPR as a way to speed up the process of locating unmarked burials in various contexts.

Broadly, Historic Human Remains Detection Dogs **alert on decomposition odor when compounds contained in the soil rise to the surface**, which can be affected by how the scent finds its way to the surface (through soil disturbance, root systems, cracks in concrete, etc.).

These dogs can confirm whether human remains are present in an area or not through a final trained response (such as barking, lying down, or other trained behavior), **but may not identify the exact location or a specific number of burials.**

A dog's nose is extremely sensitive and has up to 300 million olfactory receptors, while humans have approximately 6 million. In addition, the part of the canine brain dedicated to interpreting scent is 40 times larger than humans, which means that a dog's nose is so sensitive they can detect the equivalent of ½ tsp of sugar in an Olympic-size swimming pool. However, when it comes to human searches, we remain unsure as to the specific scent compounds that detection dogs alert to, making detection training a challenge. For instance, studies conducted on the chemical odor profiles of old bones and teeth determined a reduced number and concentration of volatile compounds (or scent) that emanate off the bones. Therefore, it is less likely that the dogs are relying solely on the scent of bones and teeth and instead are alerting to the scent of adipocere (a combination of fatty acids and salts that remain in the soil as a by-product of decomposition). For this reason, a dog's training should include various training materials, especially true odour sources derived from older burial shafts.

Deploying Detection Dogs at Residential School & Hospital Sites

In the context of residential school sites and other locations where there is reason to suspect unmarked burials, Historic Human Remains Detection Dogs provide a number of benefits to help the search, including:

- Able to cover large areas
- Narrow search areas prior to remote sensing surveys
- Reduce cost and time required for geophysical surveys
- Increase confidence in other methods with canine alerts
- Can work in locations where other methods may not (such as within buildings, dense brush, and on or near bodies of water)

The best use of a HHRDD team would be in the case where there is a large area, or an area unsuitable for remote sensing investigation, that is suspected to contain an unmarked grave or cemetery.

HHRDD's can cover much more ground in much less time than a geophysical survey, making it a great option to narrow down areas for investigation. A set of HHRDD teams may be used prior to geophysical survey to provide information on which portion of the landscape geophysical techniques need to be focused on. After the HHRDD survey, a geophysical survey, such as ground penetrating radar, could be conducted on the smaller area identified by the HHRDD's to reduce overall cost of these surveys and increase confidence in GPR results.

Challenges

Like any tool, technique, or technology, there are limitations and challenges to using HHRDD's to detect older human remains. These include;

- **Dogs are Beings, Not Machines**

- Dogs are beings, not machines, and require care and rest. Scent work is tiring and dogs are often required to do this work in physically demanding situations. Some statistics show that 15 minutes of searching is equivalent to a human running 9 miles. Therefore, they need to break often and have enough time to recover between searches.
- Like people, dogs can have off days and not be at their best during a search. Their accuracy and willingness to conduct a search will not always be consistent.

- **Seasons and Weather**

- Weather and temperature directly affect how well the scent contained in the soil travels upwards to the surface, which in turn determines how well a dog may be able to catch and identify the scent.
- Winter months; frozen or snow-covered ground is not recommended as the scent will not be released from the ground.
- Summer months; hot temperatures increase how quickly odors rise from the ground and causes them to dissipate quickly from the Earth's surface. Though not an ideal season to do HHRDD searches, if needed, conduct searches early in the morning or late in the evening to increase your chances at identification.
- **Ideal search times are in Spring and Fall, when the weather is cooler and the scent remains closer to the ground.**

- **Training Aids**

- It can be challenging to access true odour sources associated with human scent due to both ethical issues and Canadian regulations. Therefore, not all dog and handler teams are made equal, and will often have much different training methods and experiences. Not training on the correct materials will lead to poor results.
- Because of the challenges of access to proper training materials, dedicated dog handlers often travel to the United States for training, as they have different regulations on access and use of human remains for training materials in this context.

- The RCMP does have their own training program for their own dogs, but nothing that canine handlers outside of the RCMP can access.
- Several Canadian organizations do hold American or other certifications, so it is important to verify what training and certifications each particular dog and handler team have prior to contracting their services.
- **It is important to note that there are no national standards in Canada for historic human remains detection dog certification. Anyone can claim that they have a dog that can detect human remains or burials, so it is up to individuals to do their due diligence and determine whether a team has appropriate training.**
- **Bias**
 - **Dogs are attuned to their handler's body language. If the handler inadvertently focuses or hesitates in a particular location, the dog will pick up on this and may falsely alert.**
 - To mitigate this, best practices for conducting a survey include bringing in three different dog and handler teams at different points to cover the same area.

Best Practices & Recommendations

1. Verify the contractor is qualified to provide the service as advertised.

- a. Determine if the service provider has any American or other Certifications. Please note that there are currently no Canadian National Standards or Certifications for Historic Human Remains Detection Dogs.
- b. Detection dogs have resumes and training logs that record how much and what type of training each dog and handler team has. Each dog and handler team should have a minimum of 2 years and 2000+ hours of training and experience in the specialized training required for your situation.
- c. Confirm the type of training materials the dogs have used and for how long (number of training hours) and that the dog has undergone the specific specialized training required in your situation.

2. Deploy three dog teams. Ideally each team is trained on different source materials to mitigate false positives.

- a. Each dog team should work independently from one another and should not be on site while other teams are working.
- b. Dogs should be allowed to work off leash, unless circumstances require otherwise.

3. Bring in the first dog and handler to conduct the search

- a. If the dog alerts, GPS the location of the alert

4. Bring in the second dog and handler team to cover the same areas as the first dog team.

- a. Record the second dog's response
- b. The second dog will either (a) confirm the first dog's results, (b) alert in different locations, or (c) potentially not alert at all

5. Bring in a third dog and handler for a final survey in the same areas as the first and second dog teams.

- a. To have confidence in the alerts, you require at least two dogs alerting in the same locations.

6. Subsequent investigation

- a. These final locations where at least two dogs alerted would then be the areas that should be further investigated through a subsequent remote sensing survey, such as ground-penetrating radar. The dogs can also be brought in after a remote sensing survey to confirm the presence/absence of human remains in areas of concern.

Cost

A HHRDD survey is relatively inexpensive as compared to other methods. On average, rates can be anywhere between \$200-\$500 per dog and handler team per day, plus mobilization costs such as travel, meals, and hotel. An average survey could be roughly 1-3 days of work, depending on the weather and the area needing to be searched.

Trained HHRD dogs can cost upwards of \$20,000 to purchase and require ongoing maintenance (search/training exercises conducted 2-3 times per week) for the duration of their career, so contracting services is often a much more cost-effective way to obtain these services.

Alberta-Based Contact Information

Other Provincial Search and Rescue Dog Associations, or the RCMP may also be a good source for contact information regarding the availability of Historic Human Remains Detection Dogs.

- [Canadian Canine Search Corps](#)
 - caninerearchcorps@gmail.com
 - (403) 984-7599

- [Search and Rescue Dog Association of Alberta](#)
 - Mary Ann Warren
 - Training Director/Instructor/Author/Coordinator
 - mwtracks@telus.net

Canada-Wide Contact Information

- **(BC)** [Superior Canine](#)
 - Aaron Kemp – Owner and Senior Instructor
 - (604) 607-3419

- **(BC)** [CPA Recovery K9 Unit](#)
 - Gail Holotuk President Canadian K9 Search & Recovery
 - (604) 315-3694
 - info@cpak9.com

- **(ON)** [Best Friends Dog Training](#)
 - Kim Cooper – Owner and Senior Instructor
 - (613) 667-9948
 - info@bfdogtraining.ca