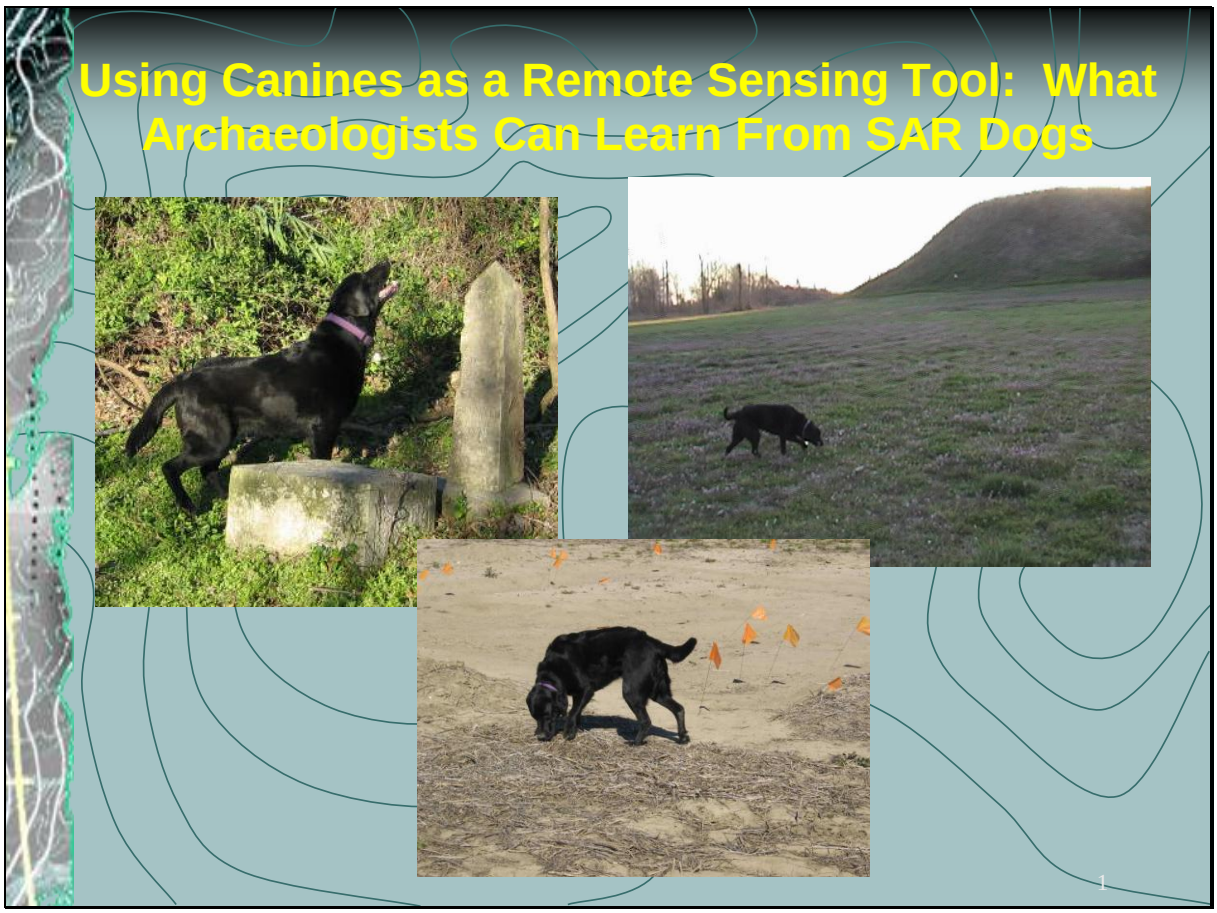


Canine SAR Background:

•Certified 3 canines in various specialties (live - wilderness & disaster, cadaver – land, building & water)

•FEMA Canine Search Specialist

•Approximately 300 searches since 1989 working with local, state, regional, and federal agencies to locate missing persons.

- •Including Operation Noble Eagle - Pentagon September 16-27, 2001 for Human Remains Recovery;
  FEMA deployments: LaPlata Maryland tornado 2002, and the Space Shuttle Columbia crew recovery efforts 2003
- •Specialize in training & utilizing cadaver dogs

•Currently investigating using canines for historical & pre-historical grave detection

- •Participated & instructed at the First & Second Human Remains Detection Specialized Training Invitationals hosted by the Washington County Sheriff's Department, K-9 Services of Washington County and Mississippi Department of Archives and History (John Sullivan and John Connaway)

Finding burials may lead to discovering a 'lost' camp or colony, a nomadic peoples last stop or travelers that didn't make it to their destination. Or perhaps to locate servant or slave cemeteries that lead to locating other structures not yet known. When we find burials we can better understand the people of the past. Through studying how deaths are treated: how the person is buried, what is buried with them, where they are buried, why they died and at what age, the condition of the body, etc gives us great insight to the people and culture of the time. Finding the artifacts associated with burials helps us learn who, when and what activities they engaged in. We learn what was significant to that culture and often the social structure of that society. These associated cultural artifacts are as important as the remains for unlocking keys into the past.

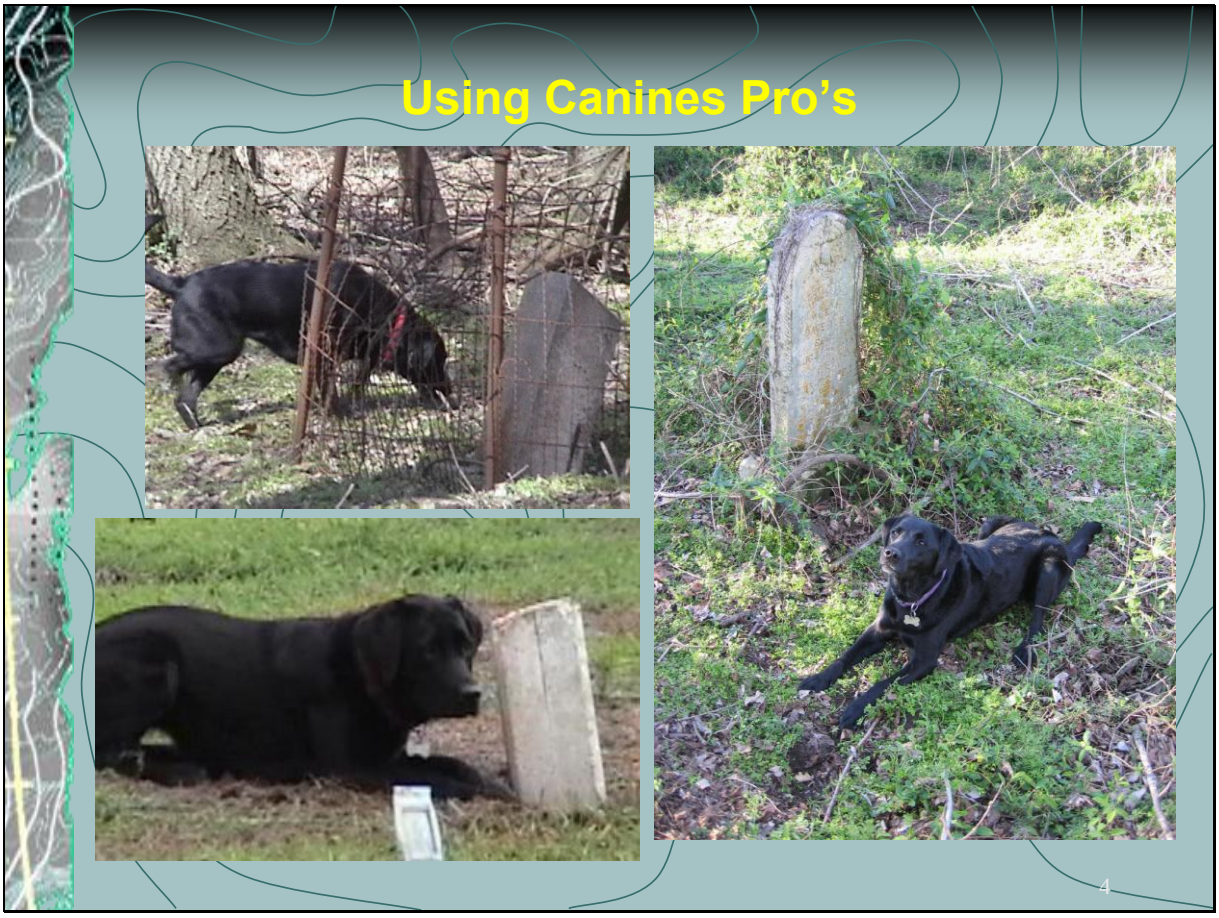
If a dig site is suspected to have remains, this can be planned for rather than reacted to. We can protect and preserve these sites so they are not accidentally or maliciously harmed. Often unmarked burials are damaged or destroyed because no one knew they were there until construction. Maybe there wasn't any oral or written history of them available to the surveyors. If burials are located before hand, developers can plan for preserving these sites into the site plan.

In order to protect the sites, one must first know the location, size and shape of the burials. Is the site a single burial or an actual cemetery? How large of an area does it entail and what are the boundaries? Are there outliers near the cemetery (servants/slaves, woman who died during childbirth, or suicides)? Are there burials that are not marked due to wood decaying, the family not having funds to provide a marker, or didn't for religious reasons? Only when these are answered can steps be taken to prevent accidental disturbance of the site, as well as, hopefully respectfully mark the area to preserve and protect it. We also then have the option to study the site's artifacts including the remains, with or without excavating.

Using properly trained cadaver/human remains detection dogs can speed the site survey or help narrow dig locations. They should be viewed as a human remains detection or remote sensing tool that can help set boundaries of cemeteries, locate individual graves, or eliminate areas (free of remains). Archaeologists are limited in how they find unmarked burials Shovel-testing is often useless. GPR is expensive, you need a highly trained operator, and a narrowed area of open ground. Surface inspection is the most used technique but you would have to have some reason to suspect there are graves in the vicinity. Written documentation can be faulty as can oral history; oral history can also be told by those who do not want the land developed. Ground conditions place limits on tools as well as techniques. If the area is plowed, visual inspection is useless. Heavy vegetation growth and trees hinder GPR. Even if the area is cleared, GPR may give false interpretations for burials due to roots or air pockets. Magnetometer doesn't work in areas with heavy amounts of metal or in dense woods. Archaeologists are often left with mechanical stripping of the land. Backhoes can damage valuable information, artifacts, and remains.

Dogs are an inexpensive survey tool to perform preliminary searches for evidence of decomp. Dogs are highly mobile, can work over most ground conditions, cover a lot of land quickly, in most types of weather*, are non-invasive, and can be highly effective at locating remains or clearing an area of remains. If they are brought in early during the survey process, they can help the team give more focus to specific areas and maybe bring in additional tools such as GPR.
•Find unmarked graves or cemeteries, including locating 'outliners' near cemeteries & cemetery boundaries
•Help pinpoint burials/remains on digs or locate scattered bones

*Weather greatly affects dogs ability to locate scent and pinpoint it's source. Morning and dew are ideal and in moderate temps. The worst is hot, humid, mid-day when scent evaporates quickly and dogs work the fringe scent in vegetation, in trees, and in any shade.



Pro's of Using Canines for HRD

•Canines are proven to locate homicide and accident/natural causes victim remains, including buried remains and disarticulated remains, as well as decomp locations if actual remains had been moved

•Narrow search area for digs or to use another tool such as magnetometer or gpr

•Water search is a good comparison: dogs search the whole lake to narrow an area for divers. Saves time and resources. Highly effective.

•At times able to pinpoint burials, but…

•Need to understand scent, search at optimal circumstances for best results, and have realistic expectations of the dogs

•Despite lack of proper training opportunities for this tougher type of buried searches, dogs have shown in blind tests that a good HRD/cadaver dog can and will locate historical and pre-historical remains…even remains which did not fully decompose at the site such as the bundle burials

Con's of Using Canines for HRD

- Scent catching features
- Multiple close burials difficult to pinpoint/distinguish between
    - Example: pauper graveyard…dirt is just as saturated between bodies as at the actual remains. Probing in this case did not seem to make a difference. However we know dogs can work disarticulate scenes and super contaminated scenes such as 9-11
- Need a solidly trained dog. Solid on cadaver, and solidly proofed against hitting on extra scents (distractions, live scent, other dog's digs, fresh holes, animal dens, air exchange, etc) and used to close, detailed searching after other dogs have searched same area
- Need solid handler to recognize often subtle alerts to help determine based on conditions, where to call the source of the dog's alert and to not cue the dog into a false indication
- Don't always get trained indications: slow down, intensely sniff, change in tail, collected gait, quick/snappy turns, snort, taste vegetation, go up trees, etc but often don't indicate. The odds of pinpointing/indications increase under more ideal scent conditions (morning, moderate temps, dew).
- Terrain & weather greatly affect dogs' ability and length of time able to work (cooler & flatter & clearer, the longer they can search)
- Not yet known exactly what makes humans smell differently from animals nor exactly what the dogs are 'hitting on'
- Lack of understanding that the dog may hit away from actual remains
    - Example: my dogs indicated about twenty feet from surface recovery of Indian remains after being plowed up by a farmer. Archaeologist felt the dogs should hit where the surface bones were found - but reality is the dog will hit where the strongest scent of decomp is and those bones most likely were dragged a bit by the machinery before being left on the surface. Then again, no one moved earth to see if the dog was actually pinpointing remains left under the soil. They only looked at the surface.

Scent Theory 101

•Decomp in soil vs physical remains such as teeth, bones, sun bleached bones

•Time of day/humidity/temps crucial to outcome

- •Best time is early morning, esp if hot and/or humid day. Cool and moist is best (not cold, but cool)
- •Otherwise dogs can miss a source, or indicate further away where scent has pooled in vegetation/shade
- •Dogs also have a shorter work time period if hot

•Terrain/vegetation impact – leaching, absorption, drip line, catching features, etc

•Catching features: trees/brush/dips/depressions/shade/walls. Anywhere scent may pool up and can be stronger than actual source

•Probing helps vent scent

•Scent naturally vents at burial markers (just like buoy lines in water bring the scent to the surface)

•Finding sources freshly placed is no comparison to old sources that have absorbed the surroundings smells/bacteria's/etc. Dogs are drawn to what is 'different' in the environment.

•However, the older (100+ years) burials seem to be easier, under good conditions, for the dogs to pinpoint because the scent that is leached and absorbed into the surrounding soil dissipates over time in the surrounding soils.

Outside Tunica, MS - Hollywood Mounds.

- Video taped working two blind problems known to the archaeologists containing a bundle & a full burial
- The dogs varied in experience as did the handlers

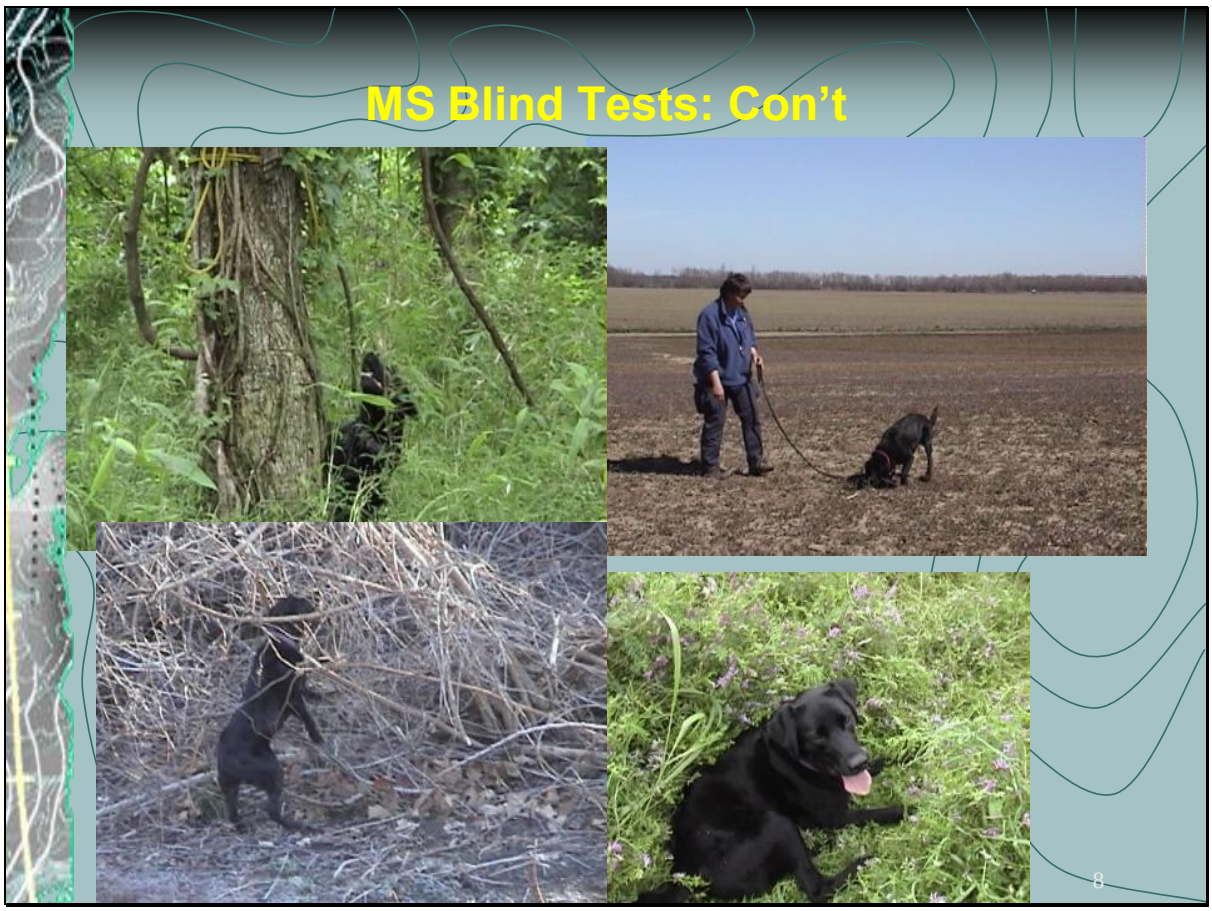
Field containing a bundle burial

- Sunshine and slightly high temps
- Two handlers' 4 dogs indicated within 3 feet of the bundle's location. One dog indicated directly on the bundle.
- Once the area was probed, many dogs indicated on the bundle's exact location.

The second area was a partially wooded hillside with a full burial

- 1st year: overgrown, however the dogs indicated on the correct side of the tree.
    - It took them longer to work through the vegetation & dispersement of scent (scent pool) compared to the 2nd year when the hillside was cleared of vegetation.
- 2nd year - 4 dogs that indicated close to bundle, all pinpointed the burial
- Many others alerted or indicated in the general area of the full burial (much greater scent w/full burial). Sometimes the dogs located but the handler misread or interfered with the dog

This testing proved that dogs can accurately find remains buried approximately 700 years ago.



A second example was the surface bone fragments identified to be from both an Indian adult and child tilled up by a farmer's tractor. The dogs indicated on several of these as well as pulled on lead to search a nearby spot that were we unable to do because the tractor driver had only agreed to stop for roughly 30 minutes. The surface bones & teeth were collected and examined by John Connaway and Nancy Ross-Stallings.

A third example is the dogs' work at Winterville Mounds. Dogs indicated on a location on Mound G that correlates to a recorded excavation done in the 1960's by Brain where coffin artifacts were discovered (wood & nails, but he stopped before excavating further since he was not interested in historical graves). An earlier archaeologist, Moore, excavated the mounds in 1908-1910 noting the locals talked of historic burials on Mound H. The dogs all had interest and indications at the edge of Mound H but due to very thick vines, they could not penetrate to search the hillside. The dogs also indicated on a large pile of dirt from another mound where remains were removed many years before in an attempt to level the mound. John Sullivan hopes to have a class sift this dirt to see if remains were missed and left in the soil.

Winterville Mounds - 1400 AD terminal date, historic burials - 1800's (1850-1900)
Hollywood Mounds - 900 AD circa 1700 (occupied), late Mississippian 1350-1450-1700, surface bones in field by Hollywood mounds - 900 AD - 1700 AD

Outside Greenwood MS, on bluffs overlooking the Delta, a home owner noticed an urn burial in the hole dig for his new septic tank. The home owner called in the Department of Archives and History. John Connaway as well as a member of the Archaeological Conservancy are excavating this site from the late Mississippian or Historic (they are not sure yet). They are most interested in the historic part because they are hoping to find burials with glass trade beads, axes and other iron artifacts, that they think are Chakchiuma, ca. 1690s-1730.

On a cool, moist, cloud covered early morning, John Connaway brought in a couple dog teams that included Lisa Higgins. At the time Lisa worked her dog at the site, they were randomly digging in the general vicinity of the septic tank as well as an area defined as a communal trash pit. There were visible animal tunnels (moles & anthills) as well as an underground leaking pipe that may have made the scent conditions ideal. Lisa's younger dog indicated on a stake in grass holding down a tarp covering the excavation pit already dug down 10-15 cm, while her second dog hit on the corner of the dig hole. The archaeologists thought the dogs might be indicating on the septic until later, roughly 3 feet down, they found human remains in poor condition dating around 1700-1730. Only the skull, most of the left ulna, radius and humerous and the right and left tibias remained. It also contained glass beads and other artifacts. At the legs they found a metal axe of the type commonly traded to the Indians by the Europeans. They believe the center of the burial had been scooped out by the backhoe when it dug the hole for the septic tank three years before. Lisa's older dog had indicated on the location of the long bones, and her younger dog's grassy stake spot indication was the skull's location. The stake venting the scent from below allowed for a pinpoint by the dog.

Caution when working with unfamiliar or new handlers/K9 teams - More talkers than doers!

•Sande Anderson mess

- •CA - Historical Grave Detection Group
- •Cadaver is cadaver. No difference b/n scent as they claim - no need for their 'historical source trained' K9s
- •However, experience with older graves definitely helps because it is a difficult search problem for the dog

•Be weary of claims that sound too good to be true

- •'Finds' by inexperienced handlers/dogs that sound too deep
- •'Finds' by those who seek media attention (very common)
- •'Finds' that have not been confirmed through ground truthing and locating identifiable human remains

•Be realistic; understand dogs have bad days or moments just like us; but know how to tell solid dogs and handlers from those who are just good talkers and those who cue their dogs based on the scenario presented.

•Realize dogs are tools. No tool is perfect, each has its time & place, plus often one tool is used that compliments another, with the combined outcome being successful.

What I would like to see happen…

•I thought this was an impossible task for the dogs, until my dogs proved me wrong in MS

•Archaeologists and anthropologists working with K9 handlers to train and 'test' dogs in this emerging field. If you have known burial sites, let a dog work the area WITHOUT the handler knowing where the source is so not to influence the dog. However, help the handler train the dog on what it is being asked to do and make sure the dog is successful even if the handler has to pinpoint the source for the dog. A dog learns best, and becomes solid, by always being successful in the learning stages. New dogs esp will need to learn how to solve these harder search problems.

•Dogs can help locate aged remains, we just need to figure out how to hone in on training for such older sites with more accuracy (at least as pinpointing as possible due to conditions)

•Hope we can start to understand the difference between successful old finds based on conditions of search area, weather, and esp the remains (disarticulated, bundle, surface bleached, etc). This is a learning process for both the handlers and archaeologists/anthropologists. The more we learn and can reinforce for the dog, the better the 'tool' will become.

•This is a growing canine field and help is needed to shape it so dogs can be used reliably with an idea of reliable training and testing standards.

Questions?

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