Geographic Information Systems Gravesite Mapping

A Pilot Project Report to the

International Committee of the Red Cross, Azerbaijan

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Overview

This report presents preliminary research using Geographic Information Systems (GIS) to assist with the International Committee of the Red Cross (ICRC) project *The Missing*, in areas that are of concern to the ICRC delegation in Azerbaijan, delegation in Armenia and Mission in Nagorny Karabakh. The authors, Derek Congram and Gill Green, were contracted to work remotely with Forensic Coordinator Maria Mikellide of the ICRC in Baku. The aim of the project is to assist the delegation with the search for and identification of missing persons, victims of armed conflict. The project's principal objective is to use GIS to map, analyse, and model potential burial sites of the missing, people who are believed to have died, and to assess their possible identification.

Much of the contract was spent organizing and consolidating data, which had been collected and stored in 16 different spreadsheets in French, English, and Russian. Based on this, we have made recommendations for future data collection and organization. We have also designed questionnaires and activities for training those who will be collecting information on missing persons and alleged burial sites in the future. These two products will ensure more complete and relevant data collection and more efficient analysis in the future.

Preliminary visualization and analysis of available data in GIS show that the range of body disposal the dead is likely quite limited. We conclude that GIS will be an effective tool for the location and identification of missing persons in Azerbaijan, Armenia, and Nagorny Karabakh. Specifically, the use of maps and geographic data can serve as an independent test of the reliability of witness testimony, which is the primary source of data on the Missing. This preliminary work has been conducted using information alleged by informants and in most cases burial site locations have not yet been proven. Only careful excavation of alleged grave sites can demonstrate the reliability and accuracy of this testimony. The experience of several major organizations, including the ICRC, in the search for unmarked burial sites shows that graves are discovered in only a minority of attempts. GIS can help prioritize grave site searches by analysing geographic patterns and congruency of witness testimony, targeting locations that are more likely to result in site discovery. A successful start to grave prospection will help build momentum for continued work in the search for the bodies of those believed to have been killed and buried. Alternatively, failed searches due to poor witness information, incomplete data analysis, and/or lack of consideration of the probability of a grave's existence, will foster cynicism about the prospects of finding and identifying the missing and returning their remains to family for proper funerary rites. Due to the small scope of this project, results should be considered preliminary. The authors of this report recommend further, more comprehensive investigation into the use of GIS in the mapping and analysis of burial sites. Future research could allow for the predictive modelling of grave locations as well as support presumptions about identity of those buried prior to excavation. This type of work is best seen as iterative: with each grave discovery and each missing person identified, results of prior analysis can be re-assessed to determine if or how a model can be made more effective. In moving forward, considerations should be made about how to better collect relevant geographic data at the start of an investigation (e.g., during witness interviews, from government sources rather than open-source).

Data processed for and presented in this report will be sent in a secure manner as requested by ICRC staff. For any questions or concerns regarding this research or report, please contact the authors at:

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Background

The authors of this report were contacted by Maria Mikellide, of the ICRC delegation in Baku, and asked to assist with a GIS-based project for mapping alleged and known burial sites, which relate to persons missing as a result of the 1992-1994 armed conflict in and around Nagorno-Karabakh, Azerbaijan. Previous research in archaeological, historic, and forensic contexts has demonstrated the potential of using "spatial thinking" and analysis to understanding human behaviour related to the disposal of the dead (e.g., Congram 2013; Congram *et al.* forthcoming; Löwenborg 2009; Lundrigan forthcoming). The application of GIS analysis in this context, however, is new and its utility has not yet been well established.

Author/Researcher Qualifications

Dr. Derek Congram is a Forensic Archaeologist and Anthropologist. He has a BA (Hons) in Criminology, an MSc in Forensic Archaeology, an MA in International Politics, and a PhD in Archaeology, with a specialization in bioarchaeology (the study of human remains in archaeological contexts). He has conducted forensic and humanitarian investigations of missing persons in 17 countries since 1999 for organizations including the United Nations, International Criminal Court, International Committee of the Red Cross, the Argentine Forensic Anthropology Team, and the United States Departments of Defense and Justice.

Dr. Arthur "Gill" Green is a Geographer. He has a BSc in Anthropology and International Relations, an MSc in Natural Resource Management, and a PhD in Geography. His work, research, and teaching focuses on post-conflict land use management. He specialises in geospatial analysis and the use of GIS in post-conflict contexts. He is currently a post-doctoral fellow in the Department of Geography at the University of British Columbia in Canada and teaches on topics including the geography of conflict, geographic data analysis (spatial statistics), and human geography.

Aim and Objectives

The aim of the project is to assist with the location of unmarked graves and, ultimately, the identification of bodies of victims of armed conflict. The principal objective is to assess the utility of GIS in the analysis of data on reported missing persons and burial sites towards this aim.

Other objectives include:

- Assess currently available data;
- Acquire new data and make recommendations on future data collection;
- Coordinate relevant data into a single, purpose-built master spreadsheet;
- Code data for geographic analysis;
- Create digital map layers in GIS, using base maps, missing persons last-known-locations, killing/death sites, alleged burial sites, etc.
- Preliminary spatial statistical analysis of sites, including cluster analysis
- Assist the development of Standard Operating Procedures for GIS grave site mapping
- Assess the current and future potential of GIS towards finding missing persons

Data, Analysis, and Results

Data acquisition

The principal data for this study previously had been collected by ICRC staff and includes reports on missing persons (their identity, location, circumstances of disappearance), armed conflict incidents that resulted in deaths, and alleged burial sites. This type of information provides the bulk of what will be entered into a GIS and analysed against geographic data (e.g., road networks, cemetery locations).

Several hours were spent acquiring basic digital maps from open-source web-based services such as the Shuttle Radar Topographic Mission, LANDSAT satellite imagery, and layers from Open Street Map for the territory of Azerbaijan. These maps included data on road and rail networks, bodies of water, political administration boundaries, land-use, and populated areas.

After reviewing data from the delegation on the missing and alleged burial sites it became clear that several sets of human remains had been discovered by HALO Trust, an organization conducting landmine removal services. There is also another similar organization, the Azerbaijan National Agency for Mine Action (ANAMA). Recognizing that these agencies would have first-hand information on presumably conflict-related deaths and also excellent maps and related documentation, we advised Forensic Coordinator Mikellide to contact these organizations about sharing maps and details related to the discovery location of human remains. The nature of this type of data, often coming from sensitive government records, has resulted in a delay in the response to the request. Although HALO Trust has provided some maps and satellite imagery, it is our understanding that at the time of reporting neither HALO Trust nor ANAMA had established a formal agreement to share data with the ICRC related to this project.

Data management

As this work was a pilot project examining a new application of GIS, there are no established methods or step-by-step criteria to guide the work. The work process was dynamic and involved frequent communication and coordination between the two consultants and the

Forensic Coordinator, and she with her staff. For previous research on Bosnia-Herzegovina, we had created a master spreadsheet and codebook for entering and coding data. We passed this to the ICRC staff and used it as a model for the work in Azerbaijan.

Early communication with Ms. Mikellide showed that potentially relevant data held by the ICRC for GIS analysis came from various sources, was stored in at least 16 different spreadsheets and one geodatabase, was recorded in three different languages, and was of mixed or unknown reliability. The first task coordinated work with her and her colleagues to translate, review, and consolidate all potentially relevant information. Some useful classes of data, such as political administration categories (e.g., villages, districts) were relatively easy to establish and compile, but required local expertise, particularly when places might have more than one name. These also had to be assessed in terms of changing or alternative place names according to different linguistic groups and changing political administration over time. Some data types, such as the degree of clandestinity of an alleged burial site, are the result of qualitative assessments. These might be the product of local knowledge (e.g., the town where the alleged burial took place had been abandoned during the war) and expertise (e.g., assessment of location observing satellite imagery). Thus data acquisition and organisation was only achieved by combining efforts of local staff, the ICRC delegate and her communication with other institutions, and the external consultants.

Organizing all available data into the master spreadsheet and preparing it for analysis occupied a significant portion of the contract (approximately 50-60%) and although this had not been anticipated at the beginning of the project, it should be seen as an investment that facilitates future analysis and informs on the future collection, storage, and organisation of data.

Some of the geographic data compiled had limited detail. For example, analysis of several data sources for water features in Azerbaijan showed significant inconsistencies and poorly georeferenced features. Rivers and water bodies shown in ICRC files, ESRI files, and other sources were either inconsistent or incorrect. An accurate understanding of water features is important as it may reveal areas where soil composition and compaction can accommodate burials (e.g., loosely compacted sand) and water features can form a significant landscape hurdle for burial site choices (e.g., exposed bedrock). A new dataset of rivers and bodies of water was generated by the consultants through downloading and processing Shuttle Radar Topography Mission (SRTM) satellite data (one arc-second, approximately 30 metre resolution). Processing allowed development of an elevation model, slope model, hydrologic model of rivers and bodies of water for the entire country, and a viewshed analysis (which models the visibility of burial sites from points in the landscape – possibly an important factor for understanding the behaviour of those selecting burial sites, particularly if they are attempting to hide victim bodies). Figure 1 shows the SRTM elevation model. Most manmade irrigation structures are not evident in slope analyses. So, data on canals and major ditches (both used for irrigation) were derived from Open Street Map and merged with the satellite derived hydrologic model.

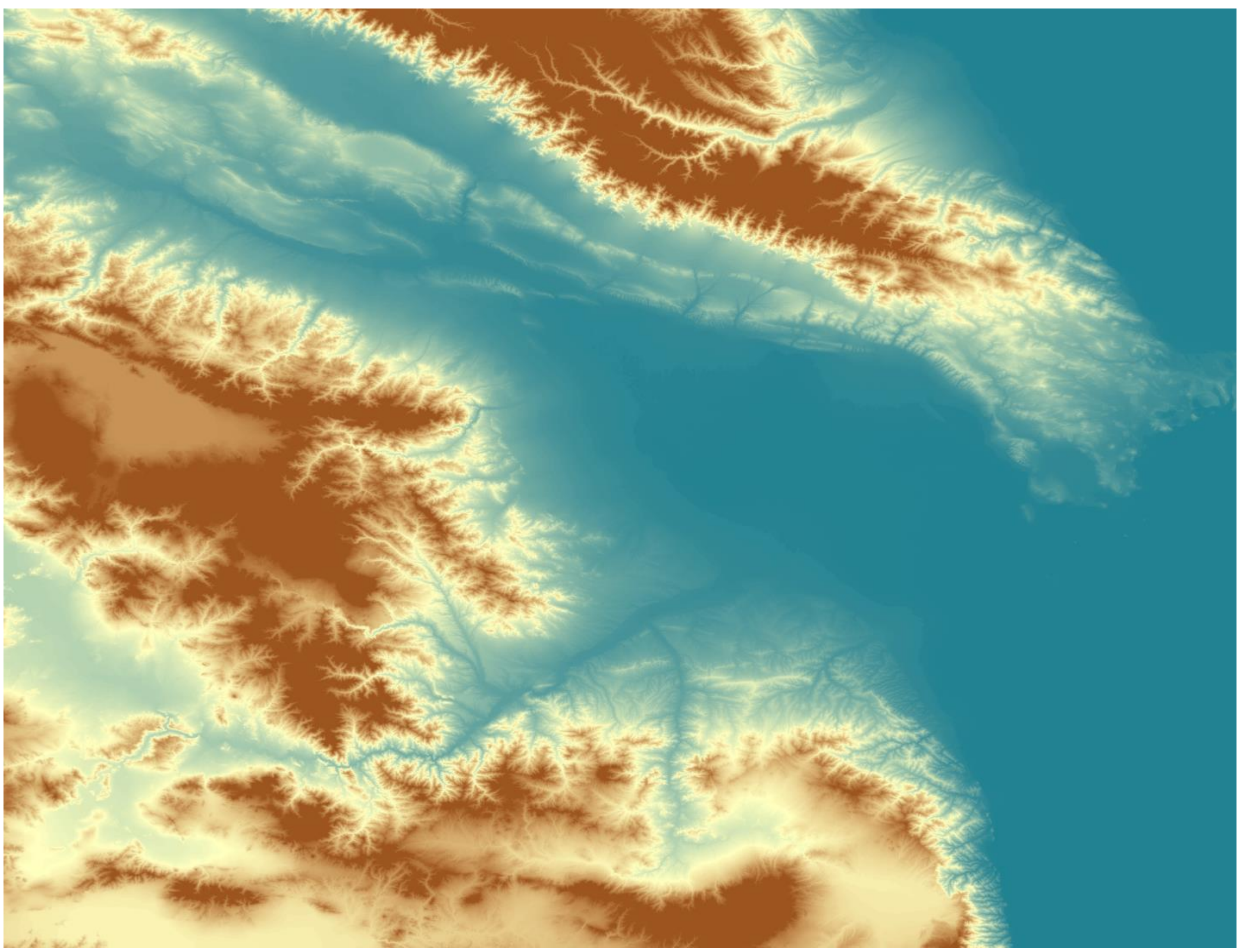

Figure 1. Elevation Azerbaijan (SRTM 1 Arc Second). Darker red reveals higher elevation.

Figure 2 shows slope and reveals the rivers and bodies of water derived from the hydrological analyses. Since SRTM has only recently become available at the one arc-second resolution for Azerbaijan, it is possible that this is the first time that water features in Azerbaijan have been digitally represented using this data and methodology, so we believe that this dataset generated for ICRC may be the most representative digital dataset of rivers and water bodies available for Azerbaijan (though it could be further improved given time).

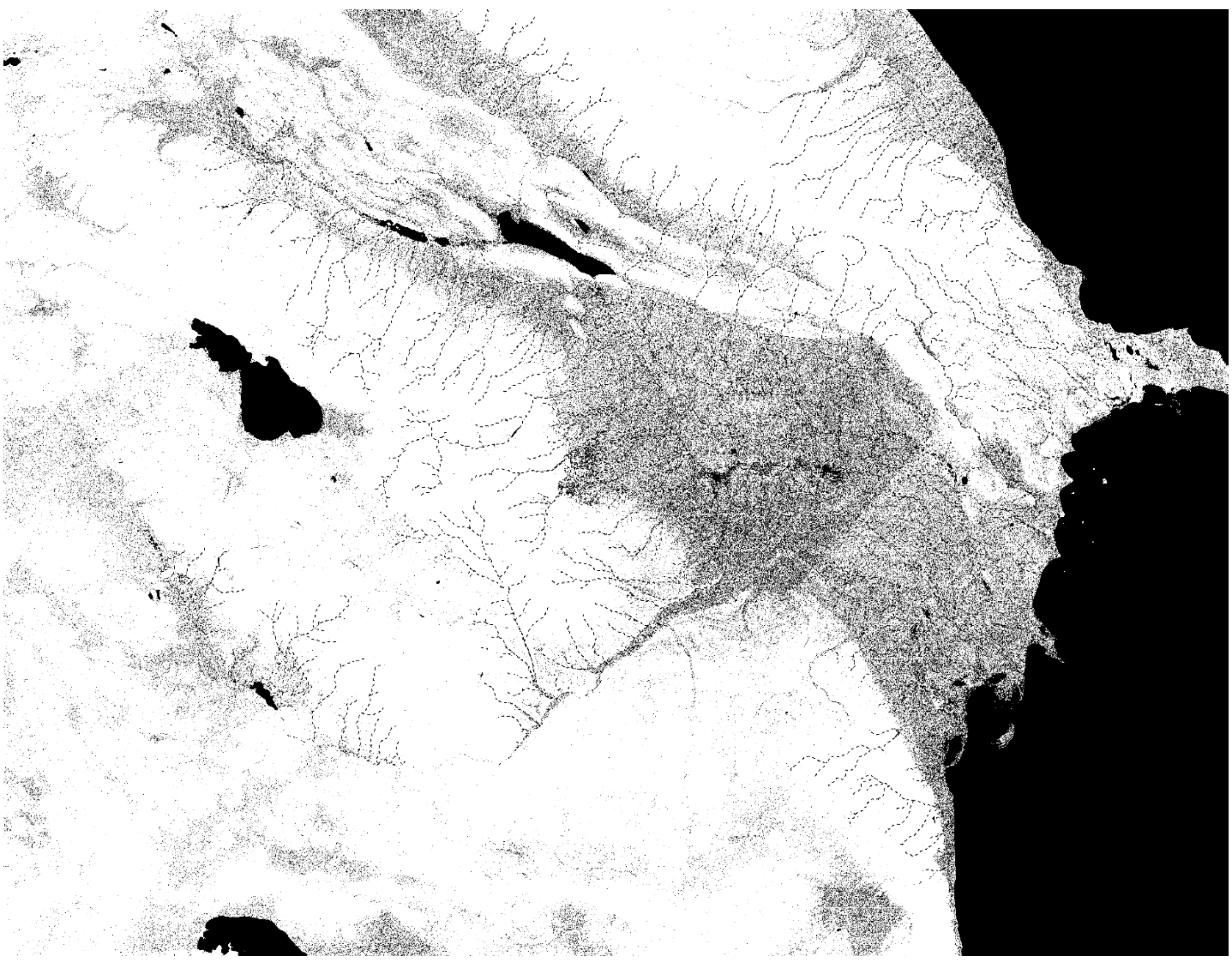

Figure 2. Map of slope including rivers and bodies of water. Darker areas have relatively lower slopes.

Analysis

In total, 137 alleged burial sites with an estimated minimum of 2,477 bodies were listed in a master spreadsheet that was built with collaboration of ICRC staff (figure 3). The reliability of these locations and body numbers is unknown. Preliminary assessment of the sites shows a variety of classes of alleged or known burial sites: battlefield related deaths (which can number into the hundreds or more); individual or multiple deaths outside of formal combat and of non-combatants; and hospital deaths.

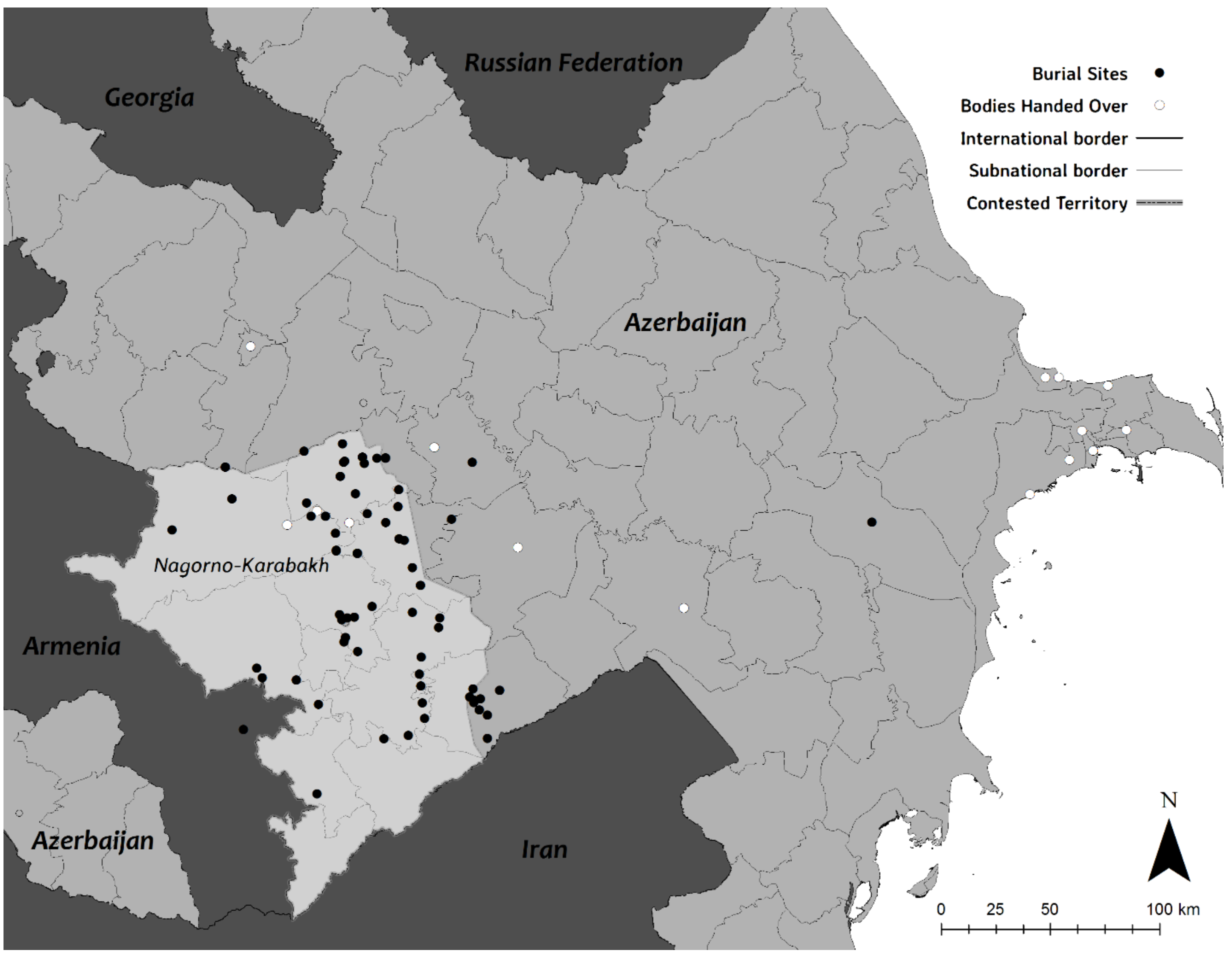

Figure 3. Overview map of all 137 cases considered in the study.

The majority of graves are unconfirmed and some graves are reported to have "hundreds" of bodies (a minimum of 100 were used for these sites to tally the total estimated bodies in the master spreadsheet). For long term management of reliability, we recommend developing an indicator scale of reliability that can be applied to geographic evidence in each case as it would provide more information for targeting specific cases for building and testing models as well as judging error for inferential statistics. We have implemented a very basic version of such a scale for this project. Of these original sites, several were held out of analysis as they had data or evidence issues that need to be resolved. These include 26 graves of named persons, bodies which were purportedly identified by the government and returned to families for burial (the white dots in figure 3). In some of these cases, families have expressed doubts about the reliability of the identification, but had not been able to view the remains prior to burial. These are referred to as “Bodies Handed Over,” or “BHO.” Due to the particular nature of the burial location (body transferred from another location post-mortem to the family and then interred in a formal burial ground) and the unknown reliability of the identity of the deceased, these sites were not included in analysis. Another 20 sites were excluded from analysis because they had multiple location entries (more than one set of coordinates for burials) which confounded their spatial location (though with some investigation of why there are multiple coordinates listed these sites could be reintroduced). There were 83 sites analysed on the basis of the data completeness and estimated reliability. Information from case materials on the sites was coded for mapping and spatial analysis. Latitude and longitude data was converted to decimal degrees for these 83 sites for entry into the GIS (this was also performed for BHO cases). Different layers of data (road network, populated areas, land use, etc.) were acquired, examined for errors, cleaned, and re-projected into the GIS. Like the master spreadsheet data entry, this data acquisition, coding, cleaning, and processing took up most of the consultants’ time allocated to the project.

Exploratory spatial data analysis (ESDA) was conducted on the data sets; specifically cluster analyses and proximity analyses were used to understand general characteristics of the sites in relation to surrounding features.[1] Cluster analyses examine the degree of dispersion or clustering of site locations at different scales. In other words, they examine the patterning or

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[1] While ESDA sometimes uses regression models, the data set in its current form cannot be input into a regression model for ESDA because too many variables are missing.

randomness of sites, which can lead to hypotheses about how people select sites for body disposal. Ripley's K and kernel density functions were used to measure spatial clustering (statistically significant clusters). In Figure 4, kernel density is displayed showing clustering at less than 5 km for a majority of sites. While clustering at 5km is a significant finding, the cluster distances must be compared to the features on the ground to understand the nature of clusters.

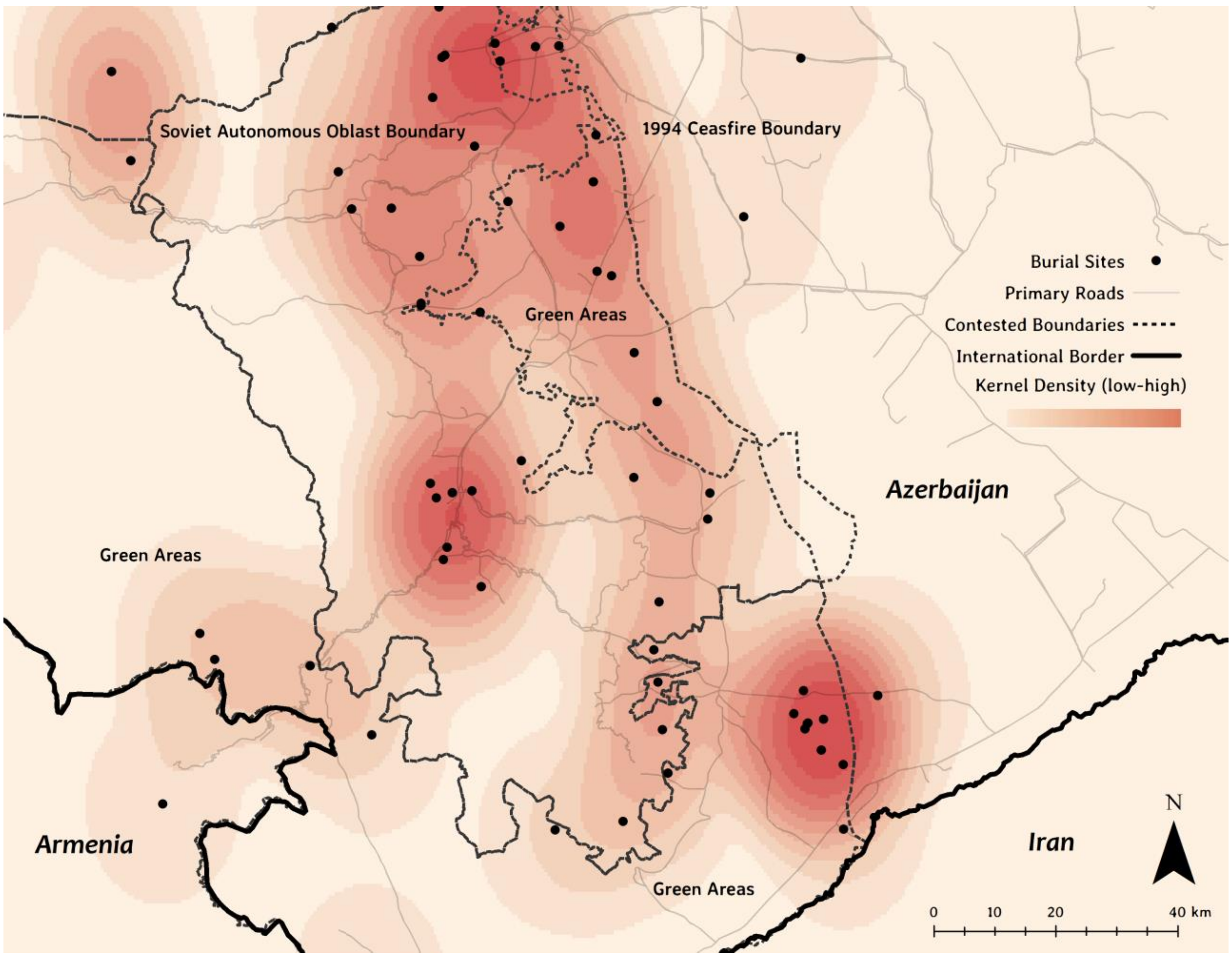


Figure 4. Cluster analysis kernel density in Nagorno-Karabakh

For example, many of the clusters are in close proximity to the 1994 Ceasefire Boundary. The average distance from the boundary was 14.5km (standard error of 1.7km), yet 44 of the 83 sites were less than 10km away from the boundary and 15 sites less than 2km. In fact, in Figure 4 the spread of density kernels toward the borders reflects anisotropic patterns and indicates that when site clusters are identified near boundaries, the best search strategy may be to examine areas that lead toward the boundary.

Proximity metrics reveal patterns in the location of burial sites in relation to roads, water, and other spatial features. Tables and figures on the following page list results of the proximity analyses for several spatial features. Roads were one of the more complex spatial features to represent due several conflicting data sets and inadequate resolution of data for understanding burial site locations. We processed 53,081 kilometres of road network from Open Street Map (OSM) data to get a better sense of roads in Azerbaijan. OSM data uses a hierarchy to categorize roads and often includes smaller paths and tracks not represented in major road networks, which is very useful for understanding possible burial locations. We explain below how we collapsed some of the OSM road categories to facilitate analysis and present some patterns involving road types and burial sites.

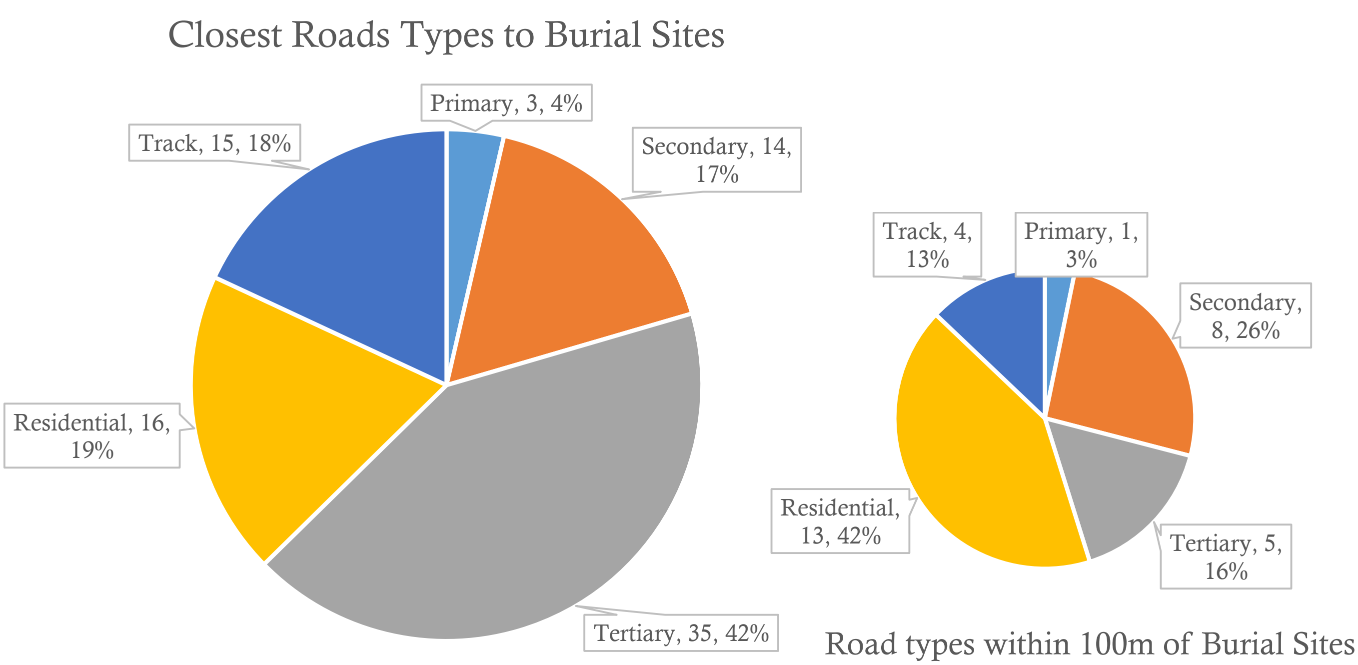


Figure 5. The closest road feature to each site.

All sites in the sample were within 7900 metres of a road. The majority of burials sites are found closest to minor roads - tertiary, residential, or track (see Figure 5). These road types are explained in more depth in Table 1. Only two burial sites were more than 5km from a road, while 31 sites (37.4% of sample) were within 100 metres (see Table 2 and Figure 5). Of these 31 sites, 81% were located near minor roads. In terms of the size of graves and alleged number of bodies, 1648 bodies (average grave size of 27.9) are within 500 metres from a road, and 512 bodies (average grave size of 16.5) are within 100 metres from roads. There was an interesting, significant increase in average number of bodies between 100 to 500 metres from roads. In this band of space, 1136 dead were at 28 sites, giving an average grave size of 40.6 (p-value = 0.1308). While not statistically significant, it is anecdotally interesting and it could be worth investigating whether the increase over distance from roads reflects an attempt to conceal larger burial sites.

Table 1. Burial Site Distance to Roads

Road Type	Description
Primary	Under "trunk" and "motorway" categories, this is the most important road type in a country's system (often link larger towns). There were no "motorways" and only one case of "trunks" in our area of interest, so the one trunk was collapsed into primary.
Secondary	The next most important roads in a country's system (often link towns.)
Tertiary	The next most important roads in a country's system (often link smaller towns and villages). The categories "service" road and "unclassified" were collapsed into tertiary. These are minor roads that may link villages or provide access to commercial property. The word 'unclassified' is a historical artefact of the UK road system and does not mean that the classification is unknown.
Residential	Roads which serve as an access to housing, without function of connecting settlements. Often lined with housing.
Track	Roads for mostly agricultural use, forest tracks etc.; usually unpaved (unsealed) but may apply to paved tracks as well, that are suitable for two-track vehicles, such as tractors or jeeps.

Table 2. Burial site distance to Roads (n=83)

Distance from Road (metres)	Number of Sites Counted	Percentage Total
8000	83	100%
5000	81	97.6%
1000	66	79.5%
500	59	71.1%
200	39	47%
100	31	37.4%

Table 3. Number of graves, number of alleged bodies, and average distance for burial sites within 500m of road, sorted by road type (n=59)[2]

Road Type	Num. of Graves	Number of bodies	Average Num. bodies	Average Distance (metres)
Primary	2	42	21	239.7
Secondary	6	193	32.2	165
Tertiary	31	909	29.3	167.7
Residential	12	409	34	98.9
Track	8	95	11.9	126.5

Road types may make a difference in body disposal behaviour, the number of bodies per grave and the distance from the road may be influenced by road type (see Table 3). It must be noted that body disposal relative to a road type is almost certainly influenced by multiple factors, including the place of death (e.g., relative distance from different road classes), the number of victims, and the security conditions in an area at the time of burial. Nevertheless, these tests show that understanding road class and probable distances from roads can provide an indication of where to search, or where to look for witnesses, though more in depth analysis and reliable data sets will provide better estimates.

Land use is poorly documented in Azerbaijan. There is the possibility of conducting land use classification based on satellite images, but for this project we have used existing land user cover data sets to estimate burial site characteristics (see Table 4 and Figure 6). The

[2] All estimates of number killed and number of bodies per grave are derived directly from the case study data provided and, upon further investigation, may not be accurate to historical events. Some alleged sites estimate "0" bodies and other sites listed as "multi," or alleged to have "hundreds" have been estimated as 100.

information in table 4 illustrates the poverty of existing data sets that describe land use in Azerbaijan.

Table 4. Burial sites as related to land use type

Type	Count
Cemetery	1
Farmland	12
Grass	5
Residential	31
Unclassified (usually forest, natural areas, or rural settings)	33

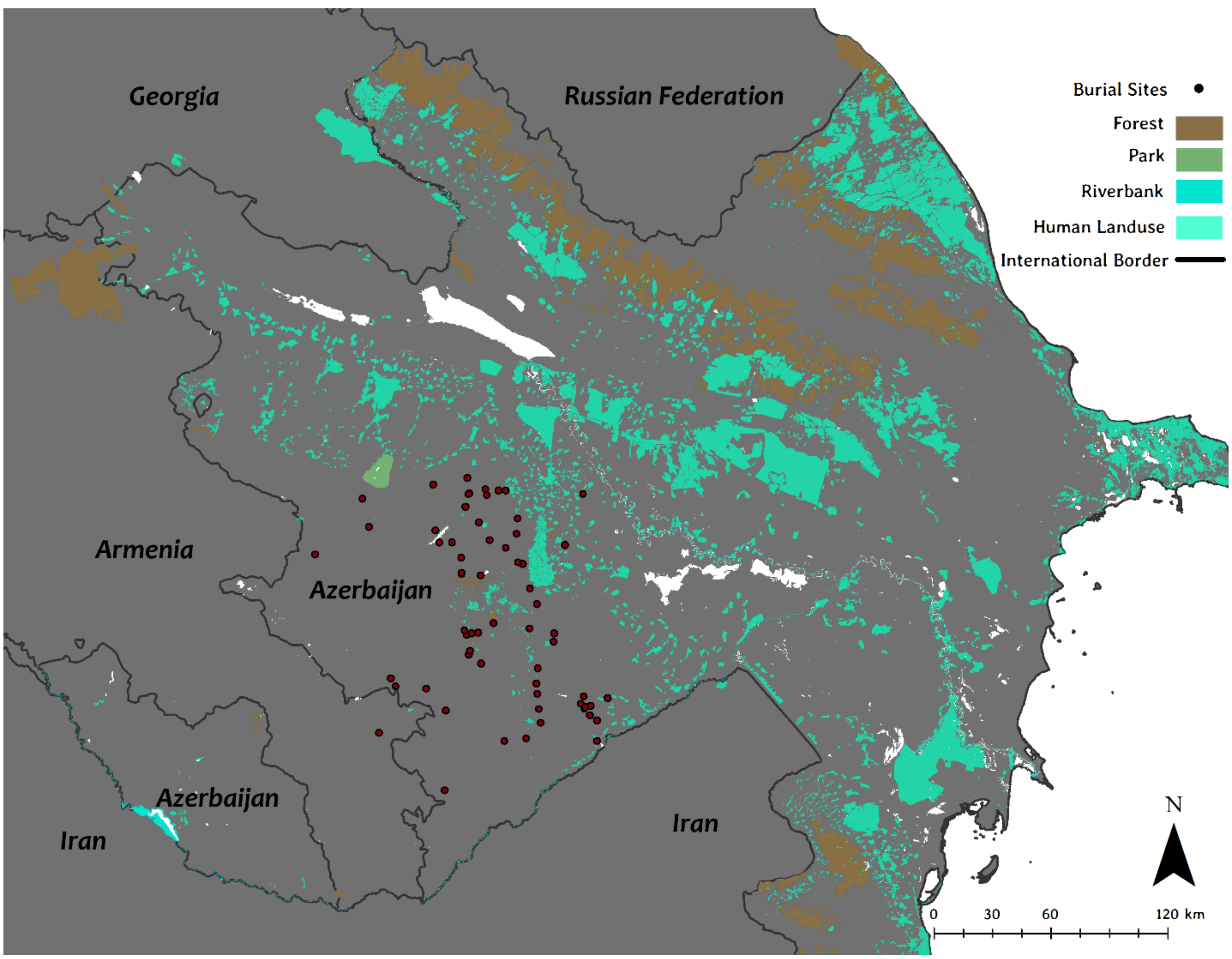


Figure 6. Land cover and land use, poorly documented in Azerbaijan.

While we know from case documents that more than one of the burial sites in our data set is in a cemetery, existing data sets from elsewhere that describe land use only identified one burial site in our data set in a cemetery. It would be beneficial to either code land use directly from data sets, or attempt to come up with a regional land use data set that is comprehensive of all burial sites.

Although not a random (representative) sample of sites, preliminary analysis of grave site locations revealed several trends. An analysis of land-use relative to burial sites showed that farmland and residential areas (as classified by OSM) account for 65% of all burial sites. Further iterations of this project can examine site specific soil and slope conditions. As well, changing political borders and combat front lines can be examined as temporal boundary constraints, which might have affected body disposal location selection.

Interpretation

Going through the available data, and discussing it with the ICRC delegate, it appears that there were general categories of body disposal locations: battlefield site burials (surface remains and burials such as at Omar Pass) and alleged burials at or around religious sites, though these appear to be unmarked (e.g., on the land surrounding the mosque in Terter, Beylegan, and Barda cemetery). Even if the religious site cemetery burials are unmarked and/or undocumented, local religious leaders or other locals might be able to provide more specific details. Therefore, areas around formal cemetery burial grounds may be of interest. There is a subset of sites at or near hospitals related to people who died while being treated for injuries.

A further apparent category is that of bodies of those who remained in villages that were mostly abandoned during fighting. Field experience in several countries (in Africa, Southeast Asia, and Europe) show that the elderly might remain in homes and later become the victims of armed attackers. In such instances, in our experience, bodies are often not removed from the place of killing and are sometimes simply left in the place where they died. In other instances, neighbours or others unrelated to the killing will bury the remains, typically on the same property as where the body was found.

The identification of only a few general “site types” can guide further searches for data and allow future analysis to be catered to a context, more precisely assessing burial locations. These observations are less the result of quantitative analysis, rather the product of simple, concerted time collecting, observing, and organizing the data. Observations are both ours and those of ICRC Forensic Coordinator Maria Mikellide.

Additional Activities

Initial objectives focussed on the organization, processing, digital display in GIS, and analysis of data related to missing persons and burial locations. In July, however, we were advised by Forensic Coordinator Mikellide that the Armenian government had suddenly communicated an interest in searching for burial sites in the near future and they were looking for advice. In order to take advantage of the opportunity to institute a systematic collection of valuable data and in support of ICRC training of the Armenian team, the authors of this study dedicated approximately 10 hours (of 80 in the contract) to several new tasks. These included preparation of lecture slides introducing the concept of GIS and its use for grave site mapping, advising on witness interviewing and training potential interviewers, the creation of a body disposal/burial interview question sequence (Appendix A), and discussions related to the possibility of equipping investigators with mobile devices that could be used for data collection and the secure collection and retention of data for later analysis.

Conclusions and Recommendations for Future Work

As this work was a pilot study examining a new application of GIS, it should be considered as exploratory research. At the most basic level, GIS is a useful tool for visualizing data on missing persons and grave locations. This study has demonstrated how data in several languages, from multiple sources, and of mixed reliability can be collated, then plotted and displayed in maps. Although a missing person can, in theory, be anywhere, spatial analysis and GIS mapping can demonstrate the geographic limits of missing persons and the range of probable burial locations. This representation of the missing is far less abstract than reams of documents and non-visual descriptions of witness statements. Maps can be very helpful in briefings to families, governments, and other organizations.

In terms of future data acquisition, although the conflict being analysed occurred at a time when satellite/aerial imaging technology was limited, given the geopolitical importance of the region it is highly possible that foreign governments, particularly those of the Russian Federation and the United States of America, have good aerial images of interest to this project. Imagery of Bosnia-Herzegovina from the US military in the mid-1990s produced excellent evidence of mass detentions and burials of bodies, the latter of which were proven by excavation of graves. Once specific areas have been identified as probable mass burial sites (individual burial sites are unlikely to be detectable in images from this time), a request for imagery with a specific date and geographic coordinates should be considered to governments that might have it. Relationships with mine-clearing agencies and other governmental/military bodies should be explored in terms of their willingness and ability to share other data and imagery relating to the conflict. It is often the military who takes responsibility for burial of the dead during conflict and they can be expected to have documentation or at least provide direct witness testimony.

At an analytical level, GIS is a powerful tool for assessing landscapes and the activity of people acting upon them. With this pilot study we have established basic geographic parameters for the investigation of the missing. We recommend expanding this work to include more sites and updated, more detailed information, which ultimately can use the positive identification of excavated sites and identified bodies as information from which an inductive location model can be built for finding new graves. The timing of an expansion, however, is dependent on the availability of new data. This is a judgment best made by the ICRC delegate, who now has a good knowledge of what type of information is useful and how it can be used.

This type of research is best conducted as a collaborative effort between subject matter experts and those with intimate knowledge of local language, customs, and the course of the conflict. In contexts where subject matter experts (such as the authors of this study) have little background knowledge on a specific conflict and the historical, political, and cultural context, analysis and interpretation is limited. Observations and interpretations in this report are those of the report authors working with Forensic Coordinator Mikellide. It is highly probable that ICRC delegation staff, particularly those who have collected and helped organise data, have made useful observations. We recommend that any future data collection should first be informed by the coordinated pooling of ideas by all of those who can reasonably be expected to help better understand the process of disposal of the dead in this context. This includes former combatants.

We, the authors, believe that although this study has been a small, preliminary, and exploratory step, it has established a model for data collection and analysis that will improve our understanding of body disposal in Azerbaijan and ultimately enable the discovery of unmarked burials. Using GIS analysis holds great potential for understanding how, where, and why people go missing during conflict and how – when the missing are in fact dead – their remains can be recovered, identified, and returned to family for dignified rites. It is our hope that the results of this preliminary study will inspire further inquiry into the use of geographic analysis towards the resolution of missing persons cases.

Works and Sources Cited

ArcGIS. Environmental Systems Research Institute. Available at: https://www.arcgis.com/features/

Congram, D. (2013) Deposition and dispersal of human remains as a result of criminal acts: *Homo sapiens sapiens* as a taphonomic agent. In: J. Pokines and S. Symes (Eds.) *Manual of Forensic Taphonomy*, pp. 249-285. New York: Taylor & Francis.

Congram, D., G.A. Green, and H. Tuller (forthcoming, 2016) Mapping the missing: A new approach to locating missing persons burial locations in armed conflict contexts. In: D. Congram (Ed.) *Missing Persons; Multidisciplinary perspectives on the disappeared*, Chapter 10. Toronto: Canadian Scholars' Press, Inc.

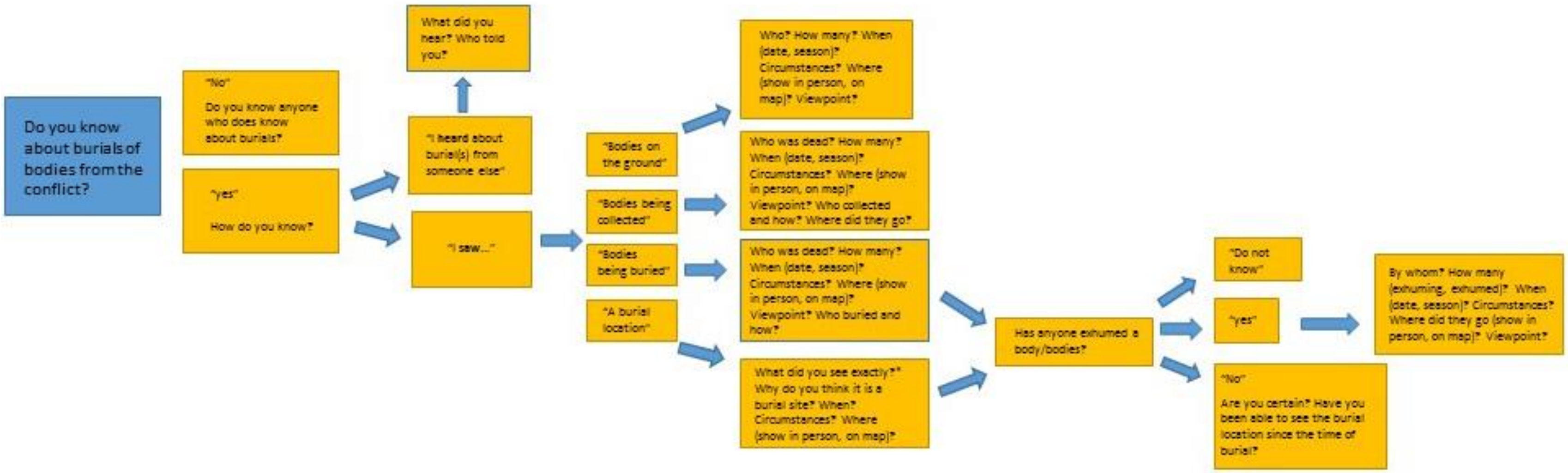
Löwenborg, D. (2010) Using geographically weighted regression to predict site representativity. In: B. Frischer, J Webb Crawford, and D. Koller (Eds.), *Making History Interactive: Computer Applications and Quantitative Methods in Archaeology (CAA). Proceedings of the 37th International Conference,* Williamsburg, Virginia, USA, March 22-26, 2009. Oxford: Archaeopress.

Lundrigan, S. (forthcoming, 2016) A review of research into the spatial behaviour of murderers and implications for investigations involving missing murder victims. In: D. Congram (Ed.) *Missing Persons; Interdisciplinary Perspectives on the Disappeared*, Chapter 9. Toronto: Canadian Scholars' Press, Inc.

OpenStreetMap. Available at: www.openstreetmap.org.

Note: Two of the works cited (Congram *et al*. and Lundrigan) have not yet been published at the time of this report submission. For copies of these, please contact the first author of this report.

Appendix A. Body Disposal/Burial Interview Question Sequence



Notes: *do not volunteer information or details at first (e.g., "Did you see disturbed earth?"), start with open-ended and general questions such as "What did you see?". Later ask for detail if it is not volunteered (e.g., if the person says that it was military personnel burying bodies, ask: "How do you know it was military"? If they respond: "By their clothing," you can then ask: "what about their clothing indicated to you that they were military? Did they have hats? What kind of hats? Did they have patches on their uniforms? What colour were their uniforms? Did they arrive in vehicles? What did the vehicles look like?")

Always be mindful of the *accuracy* and *precision* of information. If you ask about a location - does the witness make reference to landmarks (e.g., trees, buildings, etc.)? Ask if a place has changed since the time of body collection or burial (which is a general question, rather than assuming it has changed and asking *how* it has changed). Every time you collect information from someone, ask if they know of anyone else who has information on body collection or burial. Precise details can be excellent if accurate, **but** can be misleading if it is inaccurate.