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21st Century Survey in Eastern Ukraine and the Use of Technology in Insecure Environments

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Special Report: 21st CENTURY SURVEY IN EASTERN UKRAINE AND THE USE OF TECHNOLOGY IN INSECURE ENVIRONMENTS

BY NICHOLAS TORBET AND PATRICK THOMPSON [THE HALO TRUST]

A HALO NTS/EOD team leader working in Pavlopil, Donetsk oblast. Pavlopil is located close to the front lines and is badly affected by conflict events and landmines.

All graphics courtesy of The HALO Trust.



The conflation of humanitarian and military spheres has long been a feature of modern conflict, restricting access to areas in which the need for humanitarian assistance is greatest. However, the advent of mobile technology has provided novel opportunities to circumvent old problems. In Ukraine, The HALO Trust's (HALO) ability to conduct non-technical survey is restricted in certain areas, and the security environment means this is unlikely to change in the foreseeable future. Nevertheless, HALO pioneered a number of techniques that allowed for systematic assessments of the region, painting a general picture of contamination that will facilitate pro-active non-technical survey once the situation improves. This article examines HALO's work in eastern Ukraine and illustrates how tablets, applications, and geographic information systems (GIS) can enhance the capacity of humanitarian organizations to identify hazardous areas in insecure environments. In addition, the article summarizes the initial survey findings conducted in Ukraine to date by international humanitarian operators.

While the roots of the current conflict lie in the long-standing political, cultural, and linguistic divisions between the western and eastern regions, the immediate cause was a series of protests and counter-protests that evolved into full scale civil conflict in early 2014. In April 2014, two self-proclaimed "People's Republics" in Donetsk and Luhansk regions declared independence from Ukraine. Almost immediately, the Ukrainian government launched the Anti-Terrorist Operation (ATO), in an attempt to return this territory to state control.



A TM62M anti-vehicle mine identified by HALO NTS/EOD teams in Shyroki, Luhansk oblast.

The struggle that ensued has cost an estimated 10,000 lives.¹ Two years after the signing of the Minsk Protocol, ceasefire violations are a daily reality, weapons systems remain largely in place, and intense fighting occasionally occurs along the line of contact, although the front line of the conflict has remained relatively static.² The economic and human cost of the conflict continues to exact a heavy toll from communities living in Donbas, and the use of landmines and cluster munitions has been widely documented.³ Indeed, according to the *Landmine and Cluster Munition Monitor 2016*, Ukraine had the fifth highest rates of landmine and explosive remnants of war (ERW) casualties in the world.⁴

Prior to 2014, Ukraine's capacity to respond to the hazards posed by ERW consisted of the Armed Forces and State Emergency Service (SES) of Ukraine. The principal hazard was from unexploded ordnance (UXO) dating

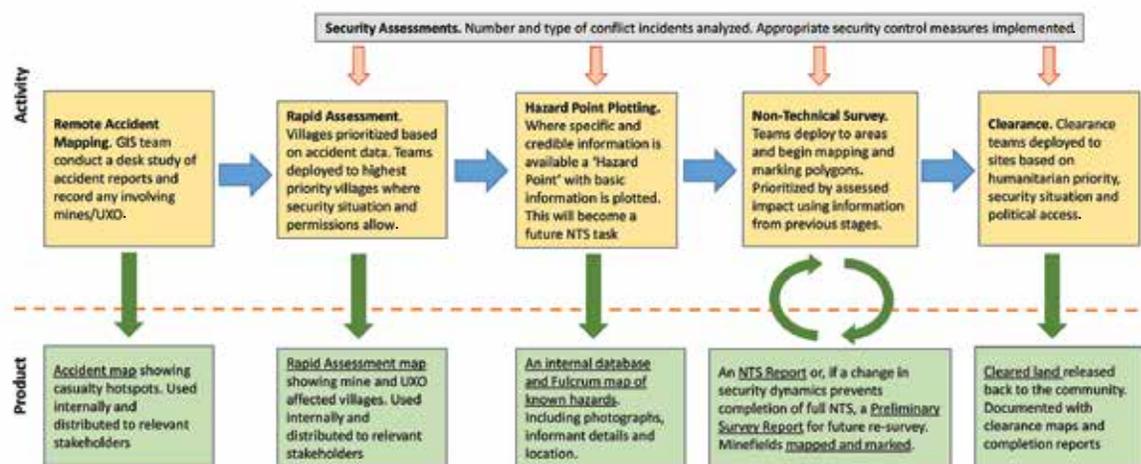


Figure 1. Visual aid to HALO's multi-layered survey process.

from World War I and World War II. As casualty rates from mines and UXO skyrocketed from the current conflict, international funding and international humanitarian operators arrived to supplement the pre-existing capacity. At the time of writing there is no national mine action center, but the lead body in mine action coordination is the Department of Environmental Security and Mine Action, a branch of the Ministry of Defense.⁵

HALO's program in Ukraine opened in November 2015. The program now has over 200 Ukrainian staff conducting clearance, survey, explosive ordnance disposal (EOD) call outs, and mine risk education (MRE) across the region. Eastern Ukraine is a complex environment in which to work. Humanitarian clearance requirements must constantly be balanced against the need to ensure the safety of personnel, neutrality, and ensure that mine action activity is not conducted in areas still considered militarily relevant by any party to the conflict.

CHALLENGES AND SOLUTIONS

The main challenges to systematic non-technical survey across the region are the rapidly changing security environment in areas close to the line of contact, and restricted access to both non-government controlled areas (NGCA), and areas controlled and used by the Ukrainian military. Fighting can escalate very quickly in specific areas. This can include high-intensity indirect fire from mortars and artillery, small arms fire, and sometimes Multiple Launch Rocket Systems (MLRS). However, this is rarely, if ever, followed up by attempts to seize territory. To mitigate these challenges, HALO adopted a survey methodology to identify areas where non-technical surveys can be conducted and, if not, to capture as much relevant information as possible to

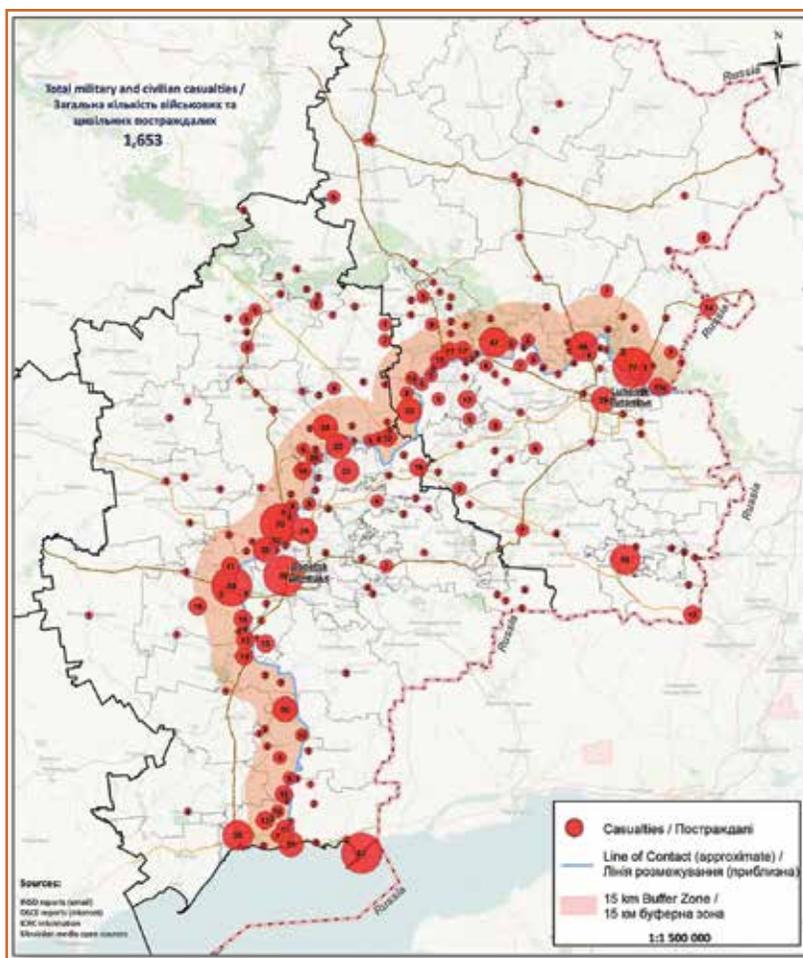


Figure 2. Results of HALO's remote accident mapping: mine and ERW casualties in eastern Ukraine, May 2014 through June 2017.

inform future decision making.

Where full non-technical surveys cannot be conducted, four layers of alternative information gathering mechanisms that gather as much relevant data as possible were created and are used to inform future non-technical survey activity. These layers (**Remote Mapping**, **Rapid Assessment**, **Hazard Points**, and **Preliminary Survey Reports**) can be conducted as standalone activities, or combined to capture increasingly more complex and detailed information. The principal advantages of this system are that all activities are recorded through a single information management system (allowing for easy presentation and analysis of data). Even in areas of extremely limited access, useful data can be extracted and recorded, ensuring crucial information is neither lost nor forgotten.

Remote Mapping. The restricted access to NGCA is the most intractable issue facing humanitarian organizations in eastern Ukraine and is not limited to those

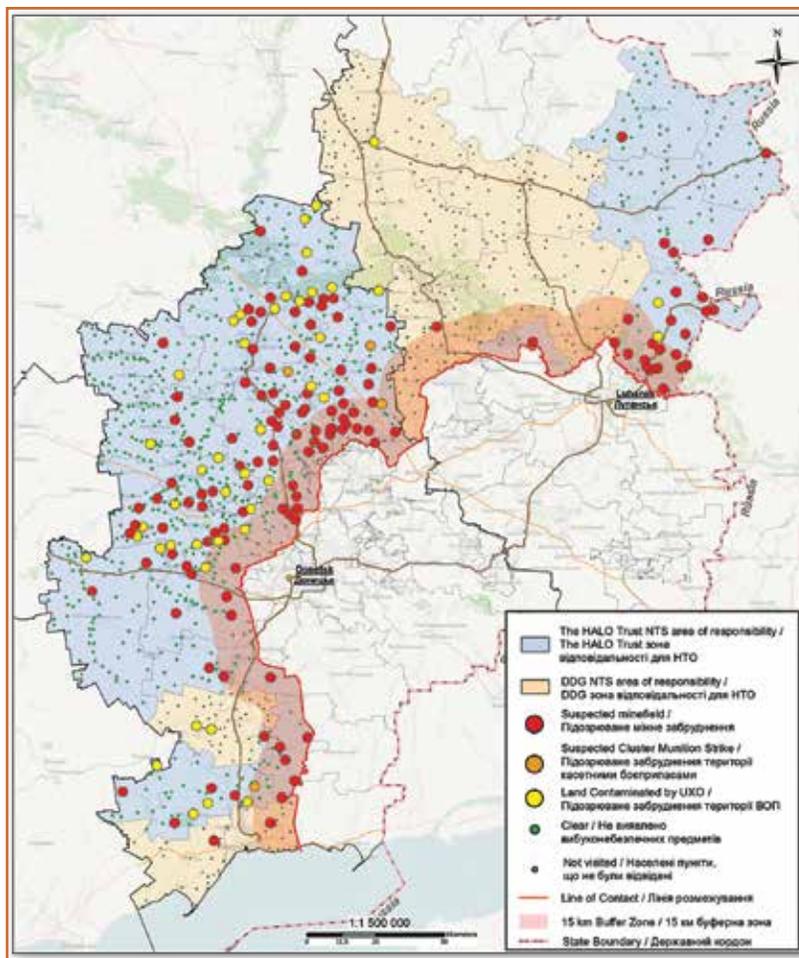


Figure 3. Results of HALO's rapid assessment in eastern Ukraine.

involved in mine action.⁶ The de facto authorities in the region have actively resisted the engagement of international non-governmental organizations (NGO), and due to the particular sensitivities surrounding mine clearance, it is unlikely that humanitarian operators will be able to secure access to these areas in the immediate future. HALO's solution to this is limited.

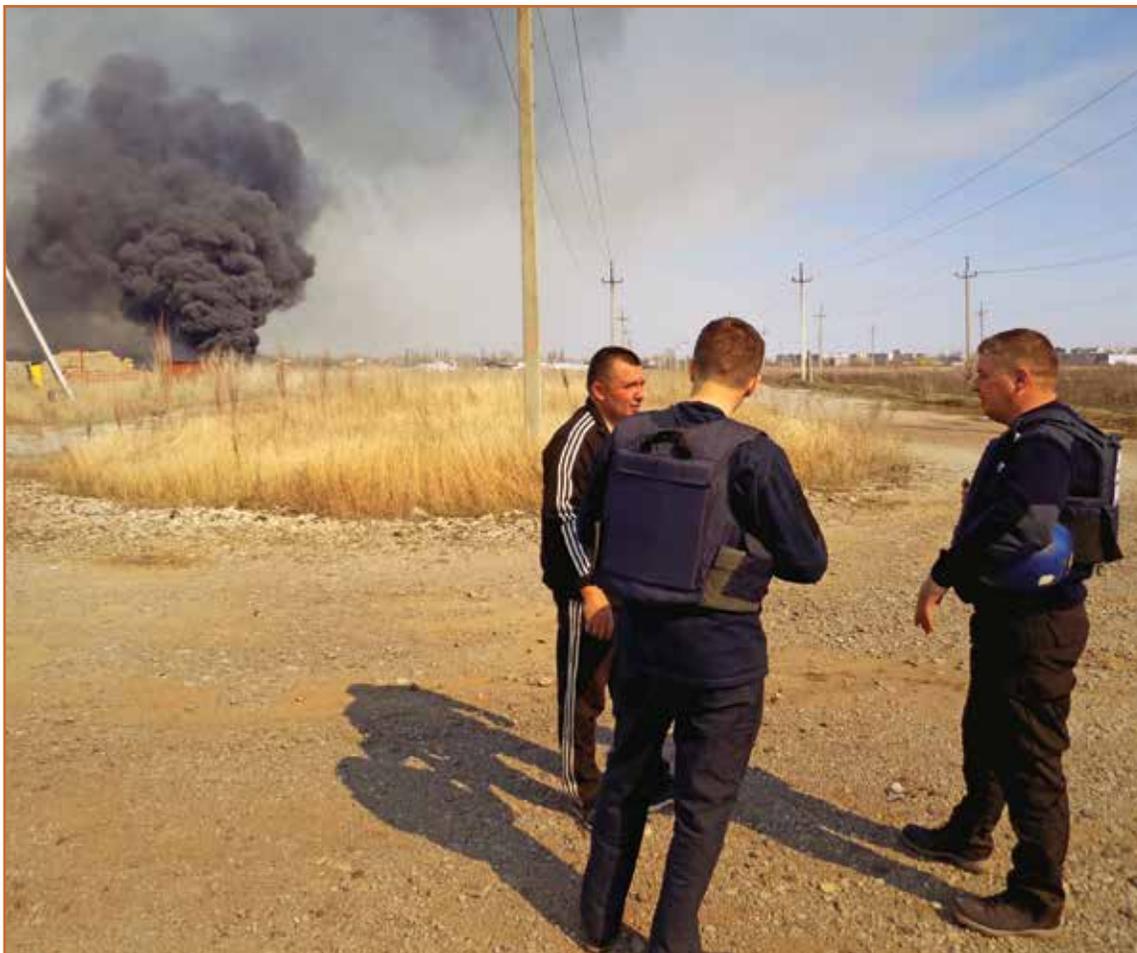
However, through the monitoring of open source media and reports of other international organizations, HALO has compiled a database of all recorded incidents that occurred in eastern Ukraine since May 2014. These incidents are recorded and analyzed by the GIS department on a weekly basis, which disaggregates information on the age, sex, and status (i.e., military or civilian) of the victims. Where the information is available, the location and type of ERW that caused the incident are also recorded. This information is then plotted on a map that forms the first layer of survey information. The map gives a clear indication of mine and ERW incident hotspots in

both government and NGCAs. This allows for the prioritization of survey activity and provides focal points for discussions with relevant authorities concerning areas in which HALO seeks permission to work. While it remains difficult to verify the information received from NGCA, the information recorded through this system is a valuable interim measure that is used by a number of international and state bodies such as the Organization for Security and Co-Operation in Europe (OSCE), International Committee of the Red Cross (ICRC), Donetsk Regional State Administration, and Civilian-Military Cooperation Unit of the Ministry of Defense.

Rapid Assessment. As illustrated in Figure 3, Ukrainian ATO command established a buffer zone in the area adjoining the line of contact. The buffer zone comprises all territory 15 km (9.3 mi) from the line of

contact, and mine action activity is restricted throughout. Mine clearance organizations must apply for permission to conduct non-technical survey and clearance on a site-by-site basis within the buffer zone. This can be a lengthy process, particularly as the military authorities responsible for managing the permission process rotate on a regular basis. However, the restriction only applies to formal non-technical surveys and clearance; as such, less formal data gathering solutions were developed. Rapid Assessment is the first and most basic level of information gathering in the field. Through the systematic visits to each village in the region, survey teams gather information from meetings with key informants (village authorities, clinics/hospitals, military representatives) and record whether or not there is believed to be contamination in the area.

This information is recorded on a digital form and plotted on a map. Each settlement visited is given a **status** (e.g., **mined** or **ERW present**) and a corresponding



A HALO NTS/EOD team interviews a mushroom farmer in Avdiivka, Donetsk oblast. Avdiivka is located around 2 km (1.2 mi) from Donetsk city and has seen some of the worst of the recent fighting in eastern Ukraine.

color code. The result is a useful snapshot of general contamination, backed up by key information on the nature of the hazard in each place, allowing regions to be prioritized for future survey work. It is a relatively straightforward system that requires little training and, as such, can be easily implemented on a new program for immediate use. Conducting assessments of this sort are also less politically sensitive than minefield mapping, and local authorities may be more likely to allow organizations to start collecting data while formal mine action permissions and accreditations are negotiated.

Hazard Points. The information gathered during Rapid Assessment is supplemented by another Fulcrum application dubbed Hazard Points. This application is used where survey teams encounter physical evidence that will warrant follow up with non-technical survey but is currently inaccessible due to the security situation. In these situations, the teams create a geo-referenced **pin** that records key evidence of mine or ERW contamination.

When a hazard is identified, the pin is placed on the map at its actual location (if seen by the team) or assessed location (if reported by a credible source).

A form linked to the pin allows key data to be recorded such as informant details, grid references, and photographs. To avoid the system being overpopulated with suspect data, a degree of quality control is required to ensure that the information is credible enough to warrant the creation of a pin.⁷ While the Hazard Points application does not provide sufficient information to justify creation of a confirmed hazardous area (CHA) or suspected hazardous area (SHA), it identifies areas for follow-up when access improves and records valuable information in the interim. Furthermore, when combined with the Rapid Assessment, it provides operations management with a mechanism to submit specific, detailed, and well-informed requests for clearance and non-technical survey to the relevant authorities, greatly increasing the chances that these requests will be approved.

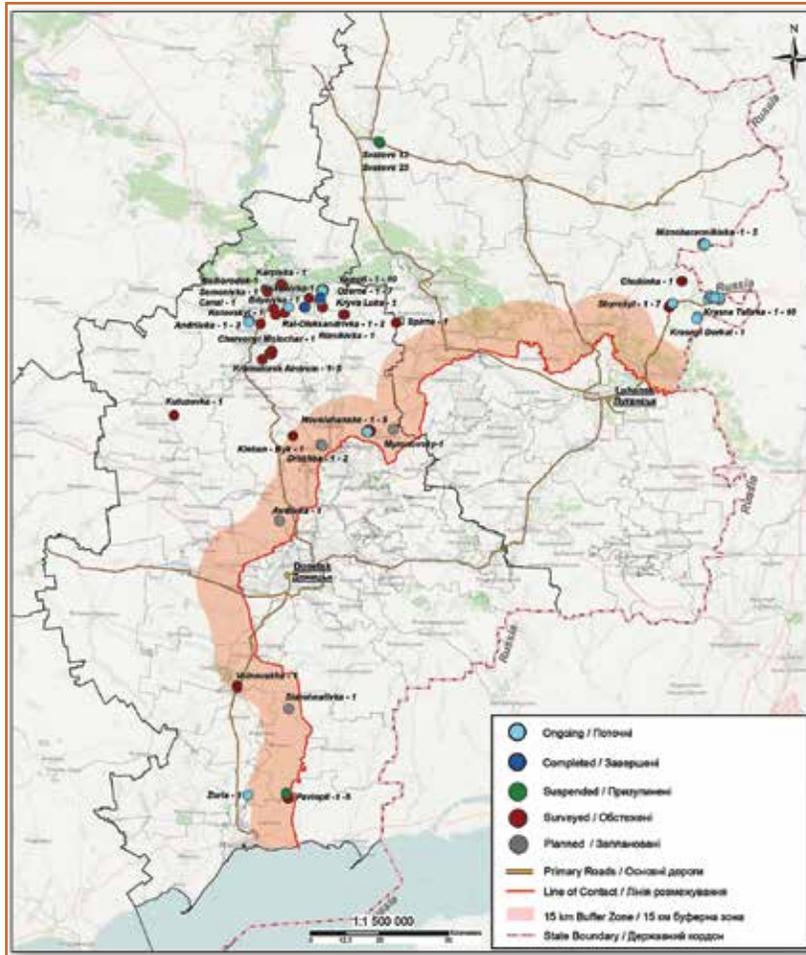
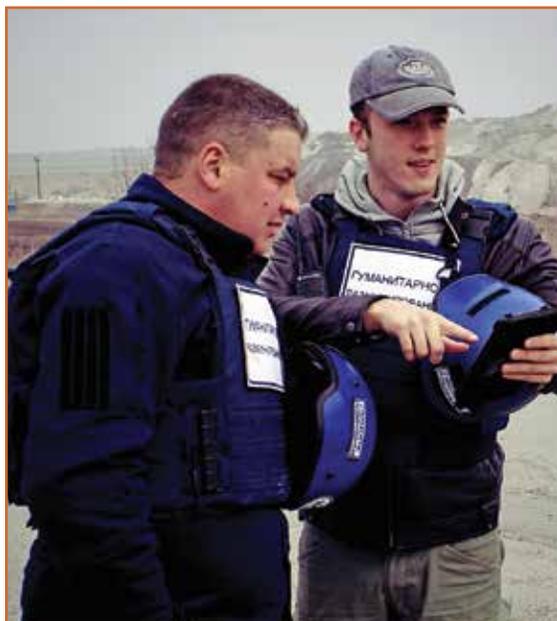


Figure 4. HALO’s current task status in Donetsk and Luhansk regions, June 2017.



HALO survey manager (and co-author of this article) using a tablet during survey operations in the buffer zone.

Preliminary Survey Reports.

The Rapid Assessment and Hazard Point applications were designed in response to external restrictions placed on non-technical survey activity by state authorities. However, an equally difficult situation may arise when permission for full non-technical survey is granted in restricted areas, but teams are prevented from completing full, Information Management System for Mine Action (IMSMA)-compliant reports by the local security dynamics.

HALO undertakes detailed security assessments and liaises closely with the local military to understand the situation ahead of deployment to these areas. Nevertheless, it is often impossible to understand the nuances of each area until teams arrive there and speak with local actors. On a number of occasions survey teams identified CHA, particularly

accident sites, but were unable to gather sufficient information to create a complete non-technical survey report. This can occur either when the accident site is located in the **grey zone** between the positions of government forces and non-government forces, or when local military advise that it is unsafe to proceed to the site due to recent conflict activity. In areas where the security dynamics change rapidly, teams may need to evacuate from an area midway through the survey process.

In these instances, submitting a full non-technical survey report is inappropriate, as the full extent of a minefield or the nature of the mine threat will not be fully established. The operations team instead decided to record this information in a separate and distinct form known as a **preliminary survey report**.⁸ This report generates a Task ID that is recorded on HALO’s database and linked to the Fulcrum tablet application ensuring that gathered information is not forgotten and that follow-on survey has access to the best information available.



An RGD-5 fragmentation grenade on a tripwire, found by a HALO manual clearance team on the task Ozerne-4 in Donetsk oblast.



A HALO NTS/EOD team leader gathers information from local communities using Fulcrum.

The HALO Trust	
Villages assessed	873
Villages affected by landmines	135
CHA/SHA mapped	82
CHA/SHA total sq m	8,368,515
Danish Demining Group	
CHA/SHA mapped	34
CHA/SHA total sq m	6,192,130

Table 1. Surveying conducted by HALO and DDG reveals the contamination in Ukraine.

Limitations. The procedures and technology discussed previously do have limitations that restrict their usefulness. First, in environments where conflict activity is ongoing, there is likely to be a significant delay between interim survey measures and subsequent non-technical surveys and clearance. In this time, the nature of the threat may change considerably. As such, the information gathered by these interim measures may be, at best, out of date, and, at worst, misleading. The need for the constant reassessment of survey information has long been a feature of mine action programs, but it is particularly relevant in the aforementioned situations.

Second, much of the value of recording information on one digital platform depends on reliable internet connections in the field. The synchronization of tablets does not require ultrafast data connections, but intermittent coverage often results in some delay between uploading information in the field and its register on the management terminal.

There is also a considerable managerial challenge: all data must be checked before being entered into the database and analyzed regularly if it is to be of value. This requires high-caliber GIS personnel who also have a good understanding of field and technical operations, and similarly technology-savvy field personnel who are comfortable using mobile technology to support their fieldwork. Many of the knowledge gaps can be resolved through training courses; however, this increases the demand on operations management.

Finally, and most significantly, it is clear that HALO's procedures do not provide complete solutions to the challenges in Ukraine. The simple fact is that the political and security environment in eastern Ukraine renders comprehensive non-technical survey activity impossible. HALO's solutions are interim measures designed to ensure that areas of high humanitarian priority are surveyed wherever possible, and where this activity is restricted, sufficient information is gathered to ensure that future activity can take place in the most efficient manner.

Results. Non-technical survey is still very much a work in progress, and given the nature of the conflict in Ukraine, is likely to remain so for some time. Yet



HALO's clearance reveals a TM62M anti-vehicle mine beside a truck that struck a mine of the same type in 2014, Krasna Talivka, Luhansk oblast.

the surveying conducted so far, by both HALO and the Danish Demining Group (DDG), has already revealed extensive contamination as summarized in Table 1.

Conclusion. Current political and military realities in eastern Ukraine preclude the possibility of comprehensive, systematic non-technical survey in those regions where the humanitarian impact of mines and ERW is highest. While some challenges seem all but insurmountable, HALO has undertaken a range of proactive measures—underpinned by advances in mobile technology—that ensure all opportunities for the expansion of survey are recognized and seized. Moreover, the interim data collection methodologies provide a framework for operations planning and management that could be applied to any nascent mine action program, especially those operating in insecure environments.

It is accepted that the measures that have been taken so far are not a substitute for full non-technical survey. Yet when the current restrictions on the mine action sector are lifted, the information that has been collected will save valuable time and resources, ensuring that the threat of mines and ERW is dealt with quickly and efficiently in the communities that need it most. ©

See endnotes page 66

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Nick Torbet is HALO Ukraine's operations manager. Nick arrived in Ukraine in July 2016, having previously been HALO's programme manager in Laos. He is the operational lead for over 200 staff and is responsible for the day-to-day oversight of the program's operations in eastern Ukraine. Before HALO, Nick served as a British Army officer for over ten years, specializing in explosive ordnance disposal.

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Patrick Thompson has worked as HALO Ukraine's survey manager since August 2016. He is responsible for the coordination and deployment of HALO's three NTS/EOD teams. He has previously worked on HALO's programs in Cambodia and Mozambique. Thompson graduated from the University of Bristol, U.K., in 2013, and briefly worked in security sector reform in Lebanon and Jordan before joining HALO in 2014.