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Cluster Munition Remnant Survey in Laos

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FEATURE

Cluster Munition Remnant Survey in Laos

As the most heavily bombed country per capita in the world, clearance of cluster munition remnants is a long and ongoing process in Laos. Norwegian People's Aid developed survey methodology to address the unique challenges posed by cluster munition contamination.

by Michael Creighton, Atle Karlsen and Mohammed Qasim [Norwegian People's Aid]

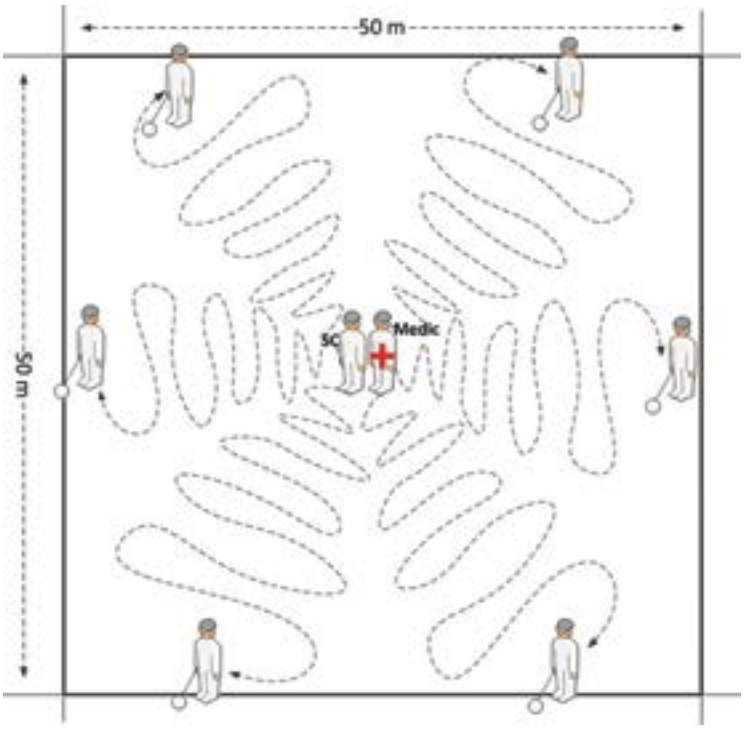

Figure 1. Surveyors move through a box beyond the initial evidence point. *All graphics courtesy of the author.*

The clearance community traditionally uses structured surveys to locate and evaluate the extent of contamination from cluster munitions and explosive remnants of war (ERW). However, Norwegian People's Aid's (NPA) involvement in Southeast Asia over the last few years suggests current practices should be analyzed for effectiveness and subsequently updated. Traditional practices focus on battle area clearance and all types of unexploded ordnance (UXO). In Cambodia, Laos and Vietnam, NPA focuses on the more commonly occuring cluster munition remnants (CMR) in its method for UXO clearance. However, NPA's method still considers and incorporates efficient ways to detect other UXO and ERW.

When trying to define the extent of the problem with surveys, CMR present a different challenge than landmines. CMR have unique characteristics, which differ from other types of UXO and landmines.[1,2] For instance, due to the lack of extensive ground warfare in Laos, the incidence of considerable fragmentation affecting detector use is infrequent and manageable. CMR also fall into more identifiable patterns than other UXO due to the deployment method. These patterns can be searched for during Technical Survey (TS). Additionally, CMR have a relatively high failure rate, making the pattern of deployment identifiable in ways that mines are not.

The duration of CMR contamination can also affect a traditional survey's ability to define the problem. Recent cluster munition strikes may provide clear footprints that can be surveyed rapidly and tasked for clearance, whereas assessing the location and extent of contamination for older strikes is more challenging. Changes in the vegetation and landscape, deterioration of CMR and interference from local populations, such as villagers completing partial demining efforts, often make the location and extent of contamination difficult to assess. This presents survey and clearance organizations with the challenge of identifying where to start and stop clearance.

For survey and clearance organizations using clearance requests from the local population as the only element of survey in their operational land release systems, the challenge of when to start and stop is not often adequately addressed. While the information the local population provides forms a large part of Non-technical Survey (NTS) and TS efforts, it

should not determine confirmed hazardous areas (CHA) or where to employ clearance assets.[3] Survey decisions based solely on requests from the local population typically involve extremely large areas that sometimes encompass entire villages. Recording a suspected hazardous area (SHA) or CHA is not acceptable unless the area has a proven, valid claim of contamination. Clearing an unconfirmed area as if it is a CHA wastes significant time, funding and effort. In contrast to the advances made in mine action over the last decade, many contaminated countries rely on civilian informers to relay locations and the extent of contamination. However, CMR require a more professional, rigorous approach.

A New Approach

Demining organizations need to compile data gathered from the local population into a more thorough and professional NTS and TS system, using local information as well as other indicators and survey methods to determine how best to clear CMR. In the case of cluster munitions, their specific types and methods of deployment can be used to develop other methodologies for NTS and TS approaches.

CMR have contaminated Laos for almost 50 years. Prolonged exposure to weather causes CMR to become increasingly volatile, which makes determining the extent of contamination difficult. Due to high levels of contamination, CMR evidence is prevalent throughout most of the country; however, determining the extent of each area of contamination is difficult. This uncertainty prohibits deminers from focusing clearance assets in the contaminated areas. By sourcing local information, NTS can determine where survey efforts should begin. These **start** or **evidence points** are identified and used to target the TS, which then determines the extent of the contamination in that area and creates a CHA. The CHA is reported to the national authority for addition to the national contamination database (in the case of Laos, the National Regulatory Authority or NRA).

Because determining where to start may be more manageable than determining where to stop or where to deploy clearance assets, NPA developed the CMR survey methodology in Laos to address the latter two issues.

Background Information

NPA found that **evidence points** may be more difficult to identify in countries with contamination similar to Laos, where contamination may be disturbed or partially exposed (e.g., some areas of Vietnam). In these cases, the existence of verified CMR in an area, determined through NTS, may be used as the **start point** for the TS effort.

Due to the lack of extensive ground warfare in Laos, battle areas requiring area clearance on the surface or at shallow depths are rare, and spot tasks are sufficient to destroy individual pieces of ordnance. However, there are vast areas where large bombs reside deep underground, and these are usually not encountered unless a particular development project requires deep excavation.[4] If an area experienced ground warfare and received extensive contamination, a CHA may be created relative to the extent of the visible contamination. This is rare in Laos, as most contamination near the surface usually consists of cluster munitions and should be addressed through different methodologies.

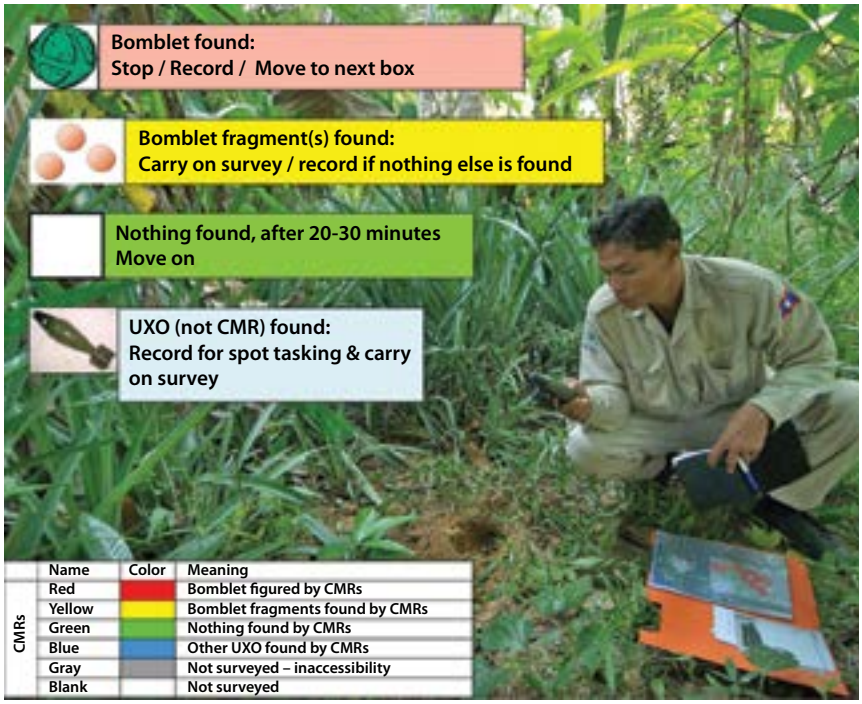

Figure 2. Team leader with GPS reading.

Technical Survey

To address CMR contamination in the most efficient way possible, NPA developed a system of TS that takes into account the unique characteristics of cluster munitions contamination in Southeast Asia, including the high metal signature of cluster munitions (i.e., footprint) and the ability to walk with relative safety through a suspected area. NPA uses a rapid

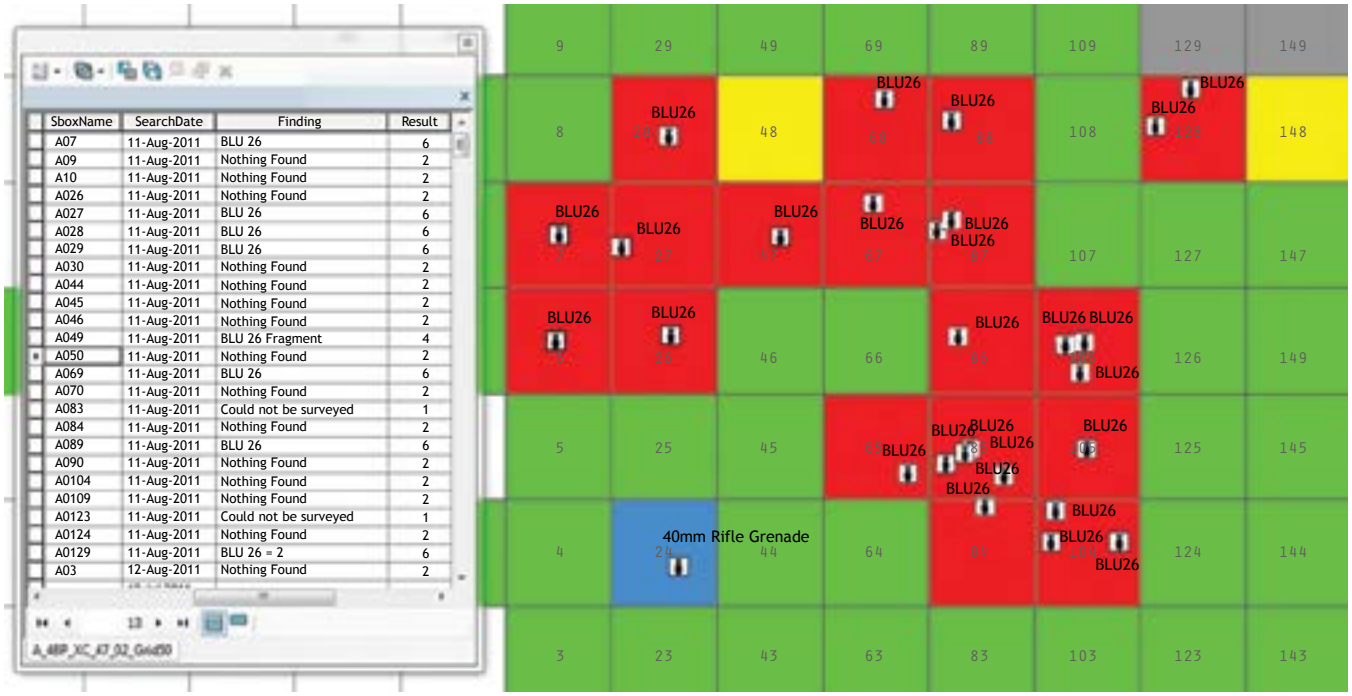

Figure 3. CHA establishment.

survey technique to effectively determine the extent of the contamination before clearance assets are employed.

In this process, the initial non-technical phase of the land release process is conducted through village meetings and review of existing documentation. Instead of identifying SHAs, the NTS records **evidence points** for both CMR and other UXO in the area. All evidence points identified in a given area (e.g., within the boundary of a village) are assigned to UXO spot task teams, while CMR evidence points are addressed by CMR survey teams.

Once the CMR survey (i.e., the TS phase of the land release process) is complete, a CHA polygon is formed around the contamination evidence and reported to the NRA as a CHA.

When clearing a CMR-surveyed site, in addition to clearing the CHA, a 50 m (54 yd) **fade-out area**, the agreed distance from a specific evidence point where the TS/clearance is carried out, is adopted from the outer-most bomblets found within the CHA polygon.[4] The area cleared within the polygon, which includes any cleared, fade-out areas that extended outside of the polygon, is classified as released ground. The rest of the area surveyed during the CMR survey, while determining the CHA, is classified as area surveyed only. This area is not released as there was never a confirmed claim of contamination from which to release it.

Notably, to release land, there must have been an actual confirmed claim of contamination. As a means of surveying an area, visual observation cannot confirm contamination or release land. Likewise, an area determined by a request-based system should be considered a SHA and not a CHA. The SHA can be cancelled; when the actual contamination within the SHA has been determined through TS, it would then become a CHA. In the CMR survey methodology a SHA is not created, as it would be artificial. The TS process commences from a confirmed evidence point, and a CHA is created through the TS activity.

CMR Survey

The CMR survey methodology is based on existing evidence (e.g., a bomblet or a valid claim of contamination) and involves rapidly surveying 2,500 sq m (2,990 sq yd) boxed areas or **boxes** beyond the initial evidence point. CMR survey determines which boxes contain evidence of contamination. Five surveyors are assigned to each box, and they use UXO detectors (e.g., Vallon VMXC1-3) set to maximum sensitivity. The surveyors move through the box in a systematic manner, under the direction of the section commander. If extensive metal contamination is encountered in any area, the area is skipped and the survey moves to an adjacent area. The purpose of the CMR survey is to paint a general picture of the contamination in the area, with which surveyors can create a CHA.

If surveyors find a bomblet, survey in that boxed area is terminated and the box is recorded in red. If the surveyors find fragments of CMR (e.g., a fragmentation ball from a BLU

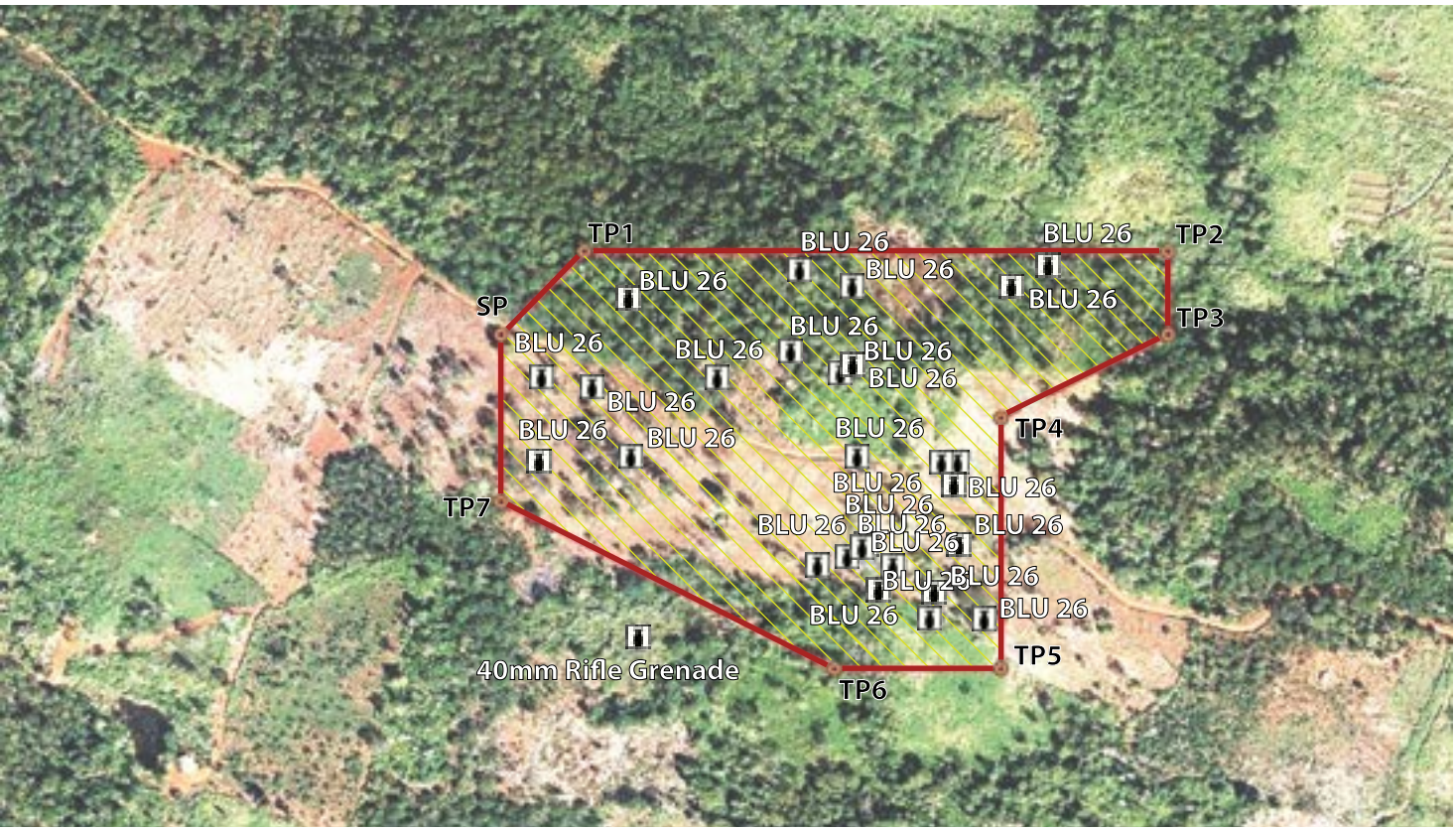

Figure 4. Village contamination.

26), the box is recorded in yellow. In yellow areas, surveys are continued until either a bomblet is found or surveyors exceed a timed limit of 20–25 minutes. In this event, the recorded box remains yellow. If no CMR evidence is found within the box during the allotted time, the box is recorded as green. Inaccessible boxes are recorded in gray, and boxes that contain other UXO are recorded in blue. While the CMR survey is focused on identifying the CHA of CMR contamination during the TS phase, all other UXO in the area are recorded during the NTS and are destroyed by UXO teams during the clearance phase of the land release process.

Five deminers and a section commander spend a maximum of 20 to 25 minutes in each boxed area. This includes the time to lay out the dimensions of the box, which is done rapidly with a rope system. An assessment during the trials showed that this time frame allows the group of deminers to cover approximately 60–70 percent of each box in the allotted time. During normal operations a CMR survey team surveys up to 4 hectares (10 ac) in each three-week period. This figure is based on ideal ground conditions and will drop as conditions deteriorate.

The efficient speed of CMR survey is possible largely because excessive vegetation removal is unnecessary. This is especially significant in Southeast Asia, where the vegetation is a dominant limiting factor in any mine or UXO operation. The CMR survey methodology works efficiently in average levels of vegetation and only requires the ability of the detector head to be pushed through and around vegetation. In most cases, only minimal vegetation removal is needed for the CMR survey methodology to operate.

Conclusion

Developed by NPA, the CMR survey approach in Laos commenced in 2010 and the methodology was fully accepted in mid-2012. As the CMR survey process involves preliminary survey, suspected areas can be confirmed and recorded prior to targeted clearance, eliminating costly clearance of uncontaminated land. This process provides a clear estimation of clearance needs, and enables Laos to make more specific and accurate assessments of needed assets and donor funding. This requirement is difficult to achieve if survey/clearance organizations accept tasks based only on community requests, where the extent of contamination is unknown until clearance has been completed. Before the use of CMR survey, alternate surveys have resulted in expensive, superfluous searches that spent unnecessary assets without finding contamination.

NPA has found that CMR survey is the best survey approach in Southeast Asia and potentially for other cluster munition contaminated countries as well. Providing answers to questions of confirmation of contamination, it remains cost-efficient and presents an effective, low-tech clearance option that allows rapid implementation. NPA has already established more than 16 sq km (6 sq mi) of CHAs in Laos using the CMR survey approach (more than 238 CHAs of known and marked areas of contamination). These CHAs were the first to be entered into the national database, providing a basis from which the national authorities can set priorities and plan the use of clearance resources.

See endnotes page 64

Michael Creighton holds a Bachelor of Arts in politics and a Master of Arts in international relations from the University of New South Wales (Australia). He served 11 years as an officer in the Royal Australian Engineers before establishing himself as a project operations and planning manager in the explosive ordnance disposal and mine action fields in 2001. Creighton has since worked in Afghanistan, Bosnia and Herzegovina, Cambodia, Iraq, Laos and Lebanon in a variety of commercial and United Nations Mine Action Service positions. From 2009 to 2011 Creighton held the position of programme manager for land release at the Geneva International Centre for Humanitarian Demining. In 2012 he joined Norwegian People's Aid (NPA) and is currently the operations manager of NPA's Survey and Clearance Programme in Laos.

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