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# Journal of Mine Action

Mine Action Information Center  
at James Madison University



## Landmines in Eastern Europe & the Caucasus

- The U.S. Humanitarian Demining Program in the Balkans, page 2
- The European Union in Humanitarian Demining, page 4
- The HALO Trust in the Caucasus, page 8
- The First All-Female Demining Team in Kosovo, page 28
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# Conference Calendar

**April 19–21, 2000**  
**Coordination of Global Mine Action Information Growth**  
 James Madison University, Harrisonburg, Virginia  
 Hosted by the Mine Action Information Center. A small, selected users group of global information centers and organizations building and managing large data and information resources for the mine action community. Discussions will involve ways to minimize duplication, strengthen cooperation, build integration, and suggest opportunities for resolving current difficulties in collecting, processing, analyzing and distributing timely and accurate mine action information to global consumers. For a post-workshop report, contact Joe Lokey, Tel: (540)568-2715, Fax: (540) 568-8176, or Email: lokeyfj@jmu.edu

**May 2–4, 2000**  
**The UXO/Countermine Forum**  
 Anaheim, California  
 DOD's Preeminent Conference on Technology, Programs & Partnerships. Additional information will be available soon.

**May 15–18, 2000**  
**OSS 21—Global Information Forum**  
 Washington, D.C.  
 Holiday Inn Westpark, sponsored by Open Source Solutions, Inc. Brings together intelligence professionals, information specialists, and operational consumers to review the acquisition, processing, and exploitation of unclassified relevant information. Ideal for international NGO information specialists, research specialists, military intelligence, police and other law enforcement professionals. For conference agenda and registration information, visit: <http://www.oss.net/OSS21.html>

**May 22–23, 2000**  
**Standing Committee of Experts on Stockpile Destruction**  
 Second Meeting, Geneva, Switzerland  
 Hosted by the Geneva International Centre for Humanitarian Demining (GICHD) as part of the Ottawa Convention Intersessional Work. Chaired by Mali and Hungary with Malaysia and the Slovak Republic as Rapporteurs. For more information, contact Ms. Geneviève Comby, Tel: +41-22-906-1665, Fax: +41-22-906-1690, or Ms. Ana Andriano at a.andriano@gichd.ch or visit them on the web at: <http://www.gichd.ch/>

**May 23–26, 2000**  
**Eighth International Conference on Ground Penetrating Radar (GPR 2000)**  
 Queensland, Australia  
 Hosted by the University of Queensland. Call for papers deadline is 5 November 1999. For more information, write to GPR 2000 Conference Secretariat, Department of Computer science & Electrical Engineering, The University of Queensland, Qld 4072, Australia, or Fax: 61-7-3365-3684, Email: [gpr2000@csee.uq.edu.au](mailto:gpr2000@csee.uq.edu.au) or visit their web site at: <http://www.cssp.uq.edu.au/gpr2000>

**May 24–25, 2000**  
**Standing Committee of Experts on Technologies for Mine Action**  
 Second Meeting, Geneva, Switzerland  
 Hosted by the Geneva International Centre for Humanitarian Demining (GICHD) as part of the Ottawa Convention Intersessional Work. Chaired by Cambodia and France with Yemen and Germany as Rapporteurs. For more information, contact Ms. Geneviève Comby, Tel: +41-22-906-1665, Fax: +41-22-906-1690, or Ms. Ana Andriano at a.andriano@gichd.ch or visit them on the web at: <http://www.gichd.ch/>

**May 29–31, 2000**  
**Standing Committee of Experts on General Status and Operation of the Convention**  
 Second Meeting, Geneva, Switzerland  
 Hosted by the Geneva International Centre for Humanitarian Demining (GICHD) as part of the Ottawa Convention Intersessional Work. Chaired by South Africa and Canada with Zimbabwe and Belgium as Rapporteurs. For more information, contact Ms. Geneviève Comby, Tel: +41-22-906-1665, Fax: +41-22-906-1690, or Ms. Ana Andriano at a.andriano@gichd.ch or visit them on the web at: <http://www.gichd.ch/>

**30 May–2 June 2000**  
**EUROEM 2000, International Conference Centre**  
 Edinburgh, Scotland  
 Brings together the scientific and engineering community to exchange ideas, information and the latest research on electromagnetics, and provides a forum for companies exhibiting technologies related to the conference. Conference organization is coordinated by the University of Dundee and the Defence Evaluation & Research Agency (DERA). The organizing committee is inviting you to submit papers for the EUROEM 2000 conference. For more information, contact: [euroem@concorde-uk.com](mailto:euroem@concorde-uk.com), Tel: +44 141 221 5411, Fax: +44 141 221 2411 or visit their web site at: <http://www.mcs.dundee.ac.uk:8080/~euroem>

**May 31–June 1, 2000**  
**International AID & TRADE**  
 New York City  
 Sponsored by the United Nations Office of Project Services (UNOPS). Conference highlights of interest to the mine action community include mine detection, telecommunications, technical aids for the disabled, vehicles, and power supply. For more information, contact The Winchester Group, Hadleigh Business Centre, 351 London Road, Hadleigh, Essex SS7 2BT, UK, Tel: +44-1702-551556, Fax: +44-1702-551511, Email: [info@aidandtrade.com](mailto:info@aidandtrade.com) or visit their web site at: <http://www.aidandtrade.com>

**June 8–11, 2000**  
**International Meeting on Advances in NQR Detection of Land Mines and Explosives (NQR-DLME)**  
 Ljubljana, Slovenia  
 The main goal of this meeting is to examine the recent advances in the capabilities and features of NQR techniques for the detection of land mines and explosives and to stimulate a strong exchange of knowledge and new ideas between basic research and applications. Paper abstracts and proposed agenda contributions are needed by February 20, 2000. For more information, contact Aleksander Zidansek, NQR-DLME Secretariat, J. Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia, Tel: +386-61-1773900, Fax: +386-61-1263269, or E-mail: [icsd@ijs.si](mailto:icsd@ijs.si) You can also find more information at <http://www2.ijs.si/~ampere/>

**June 25–29, 2000**  
**International Symposium Humanitarian Mine Action Technologies**  
 Munster, Germany  
 In 2000, a World Exposition (EXPO 2000) will be hosted for the first time by Germany. In context with the subject of EXPO 2000 "Humankind - Nature - Technology" a symposium is planned in Munster, intended to inform international experts on the current global mine situation, developments in modern mine clearance and detection technologies and ways in which they can be used. The link provides more details and the opportunity to register to attend or to offer a paper. For more information, visit: <http://demining.jrc.it/aris/>

**July, 2000 (TBD)**  
**USG Humanitarian Demining Workshop**  
 Annual meeting of US military demining training and awareness team program directors from each military theater meeting with representatives of the Department of Defense, Defense Security Cooperation Agency, U.S. State Department, and other federal agencies involved in the US Demining Program. By Invitation Only. For more information, contact Major Sue Gough at [goughs@mail.policy.osd.mil](mailto:goughs@mail.policy.osd.mil)

**July 10–13, 2000**  
**International Munition Clearance Exhibition & Conference (IMCEC 2000)**  
 University of Greenwich, Medway Campus, United Kingdom.  
 Call for Papers abstract deadline is September 24, 1999. For any questions or advice, please contact Hilary Robinson, IMCEC Office, Savoy Palace, London, WC2R 0BL, United Kingdom, Tel: +44-171-344-5476; Fax: +44-171-240-8830, or Email: [imcec@iee.org.uk](mailto:imcec@iee.org.uk). More information is also available on-line at <http://www.imcec.org>

**July 30–August 4, 2000**  
**International Conference on Subsurface Sensing Technologies and Applications (SSTA'00)**  
 San Diego Convention Center, San Diego, California  
 Sponsored by the International Society for Optical Engineering (SPIE) as part of their 45th Annual Meeting on Optical Science & Technology. For more information, contact SPIE at Tel: (360) 676-3290, Fax: 647-1445, Email: [spie@spie.org](mailto:spie@spie.org) or contact the Conference Chair, Professor Cam Nguyen, Texas A&M University, at Tel: (409) 845-7469, Fax: (409) 845-6259, or Email: [cam@ee.tamu.edu](mailto:cam@ee.tamu.edu) or visit their web site at: <http://ee.tamu.edu/subsurface-sensing-conference>

## The Journal of Mine Action

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 at James Madison University  
 Spring 2000 Issue 4.1 Volume 1

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<b>Upcoming Issues</b>	
Version 4.2 June 2000	Deminers/Personal Safety Equipment
Version 4.3 October 2000	Mine Awareness and Community Risk Reduction
Version 5.1 February 2001	Landmines Around the Asia-Pacific Rim
Version 5.2 June 2001	Biosensors and Aerospace Applications
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Version 6.1 February 2002	Landmines in the Middle East and Greater Arabia
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# The U.S. Humanitarian Demining Program in the Balkans

by Matt Murphy

As a result of years of conflict in the Balkans, countless landmines have been laid in Croatia, Bosnia and Herzegovina, and Kosovo. Bosnia-Herzegovina's landmine problem is severe, with an estimated 750,000 landmines and an undetermined quantity of unexploded ordnance infesting some 186 square miles of land. These hidden killers have killed and maimed hundreds, vastly impeded the return of refugees to their homes, and hindered international efforts to help people in the region.

Since 1996, the U.S. government has provided over \$40 million to remedy the problem and has joined with the government of Slovenia to support demining and mine action assistance in Bosnia and Herzegovina. The United States has also partnered with the Slovenian International Trust Fund for Demining and Mine Victim Assistance in the Balkans, which has proven to be one of the outstanding success stories in humanitarian demining assistance.

Although the U.S. humanitarian demining program in Bosnia-Herzegovina has reached the sustainment phase through the International Trust Fund (ITF), the United States will continue to support demining efforts there, as well as in other countries. U.S.-Bosnia-Herzegovina bilateral accomplishments include: the setting up of a U.N. Mine Action Center; the establishment of three regional demining centers; training and equipping three civilian demining forces, a total of 180 men and 27 mine-detection dogs; and setting up three military centers that have trained and equipped 1000 deminers and 70 instructors.

U.S. support of the ITF is an excellent example of regional and international cooperation and an ef-

fective mechanism for addressing the landmine problem throughout the Balkans. In Croatia, for example, the United States funded, through the ITF, six demining projects in communities that welcome the return of ethnic minority residents. These projects support U.S. and Croatian policies to re-establish a multi-ethnic society in Croatia.

The United States is also supporting the cleanup effort in Kosovo. Once that conflict ended, the United States worked with the United Nations and other countries and international donors, to implement an operation that provided mine-awareness education, mine-survey operations and mine-clearance support. Altogether, U.S. fiscal 1999 assistance for demining in Kosovo amounted to almost \$3 million.

Assuming other donor nations deposit funds into the ITF and the United States matches the funds, the United States plans to deploy similar demining teams in Albania and Macedonia to resolve landmine problems in those two countries.

Thanks to the initial U.S. funding assistance for humanitarian demining, the subsequent infusion of Slovenian International Trust Fund monies and the support of other international donors, mine-affected Balkan nations are making great progress toward the eventual elimination of their landmine challenges. ■

## Contact Information

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## USHDP

There are an estimated 60–100 million landmines worldwide. People are displaced. Their homes are abandoned. Their fields lay fallow from the encroachment of mine fields. Food, water, wood and other necessities for subsistence are impossible to retrieve without mortal danger. These people need a helping hand and the U.S. Humanitarian Demining Program is one that reaches out to them.

The U.S. program seeks to relieve human suffering while promoting U.S. interests. In addition to demining, the program's objectives are to establish sustainable, indigenous demining programs, reduce civilian casualties, allow for the return of refugees and displaced persons to their homes, enhance a nation's stability and encourage international cooperation and participation.

Mine-affected countries usually make requests through the U.S. Embassy, who then reviews each situation and forwards its findings to the Interagency Working Group (IWG), which is chaired by the Department of State and vice-chaired by the Department of Defense. After determining the nature of the mine problem and the suitability of U.S. assistance, a formal program is established in coordination with the host nation's existing capacity for demining and helps to develop a program that is managed and executed by the host nation. Typically, the U.S. program involves assisting in the establishment of a mine action center, a mine-awareness program and a demining-training program. With the goal of creating a self-sustaining host nation, the United States periodically evaluates the program and passes off its active role to the host nation, although some U.S. funding may continue to aid demining efforts.

The Department of Defense is generally responsible for funding the training part of the program, while the Department of State assists the country in implementing the program and achieving a level of sustainment. Through the Department of Defense the U.S. military has been engaged in humanitarian demining since 1994, providing equipment to demining operations, training in mine awareness and clearance as well as the establishment of self-sustaining programs.

When a direct U.S. military bilateral program is inappropriate, the United States contributes to programs by the United Nations, non-governmental organizations or international organizations.

Since 1993, the United States has established humanitarian demining programs in 26 countries and expects to expand to several more in 2000. The United States supports the Cambodian Mine Action Center, whose work has reduced the death rate from landmines by 50 percent. In Namibia, deminers have been able to reduce the casualty rate by more than 90 percent and have restored most previously mined land to productive use.

In late 1997, secretaries Madeleine Albright and William Cohen announced the Demining 2010 Initiative to execute the president's directive that all landmines threatening civilians be eliminated by 2010. To meet this initiative, Albright established the Office of Global Humanitarian Demining, which is responsible for the developing and coordinating of a U.S.-led international campaign to increase global cooperation and resources. With the U.S. Government Humanitarian Demining Program being led by the departments of State and Defense, the United States is leading the international community in the new millennium of mine eradication. ■

# EUDEM:

## The European Union in Humanitarian Demining

by Karin De Bruyn,  
Claudio Bruschini,  
Hichem Sahli and Jan  
Cornelis

### Background of EUDEM

The EUDEM project tried to provide the European Commission, as one of the largest sponsors of research in European humanitarian demining, with a survey titled "A State of the Art on Humanitarian Demining Technology, Products and Practice." Current practices and emerging technologies were discussed so that applied research can be directed toward solving real problems. Sustainable demining has to become more than "a man with a probe."

### Framework of the EUDEM project

Public awareness of the landmine problem has grown in the last 5 to 10 years, and so has the response of the international community. The European Union (EU) committed to reinforce its efforts in helping afflicted nations clear their land of these deadly weapons. Given the scale and complexity of the problem, it would be highly beneficial to increase the coordination for maximum efficiency.

At the EU level, civil research has started within the High Performance Computing and Networking (HPCN) domain of the Information Technologies (IT) program, to promote industrial R&D activities in Europe in support of humanitarian demining operations world-wide. The aim is to bring advanced equipment to the field in two to four years to improve speed, cost and safety of demining operations.

ESPRIT is an information technologies program of industrial R&D projects managed by the DG III. Three ESPRIT R&D projects started in early 1998 and six more in early 1999. These projects aim at researching, developing and testing new systems for detecting anti-personnel landmines. These R&D projects are supported by testing and evaluation, surveys and data collection. EUDEM is one of these support activities. Recent humanitarian demining falls under the responsibility of DG XIII, as an integral

part of the Information Society Technologies program.

### EUDEM goals

EUDEM established a list of goals: to establish a list of organizations to be consulted, primarily industrial companies developing equipment used in humanitarian demining; and organizations performing or supervising humanitarian demining operations. These organizations include key research centers and university laboratories active in this field.

### How goals were achieved

EUDEM accessed the Internet to find: lists of existing links and databases, internal list of persons and organizations active in humanitarian demining, EU financed projects, participant lists to well known conferences in the domain and literature on the subject. The EUDEM database was gradually populated during the survey, and will remain an open working tool allowing updates and new entries on a continuous basis. The EUDEM database is accessible world wide and not limited to organizations active in Europe.

The survey exploited a combination of literature review, telephone contacts, questionnaires, interviews and other methods.

Selected organizations were visited. Persons active at an organization level, or in demining practice and technical development were interviewed. Also, some organizations not yet active in the field but showing relevant interest and innovative ideas were included.

### Methods

In making the selection of contacts, we tried to reach the whole spectrum in the EU. The database now covers a population that goes beyond the list of people that were directly contacted by us.

### The questionnaire

After the initial list of organizations was established, the second phase of EUDEM consisted of a mailing. At first, 110 organizations were contacted on Jan. 26, 1999. These organizations received a one-page letter and a two-page questionnaire. The questionnaire was short and most questions could be answered by checking boxes.

### The typical interview

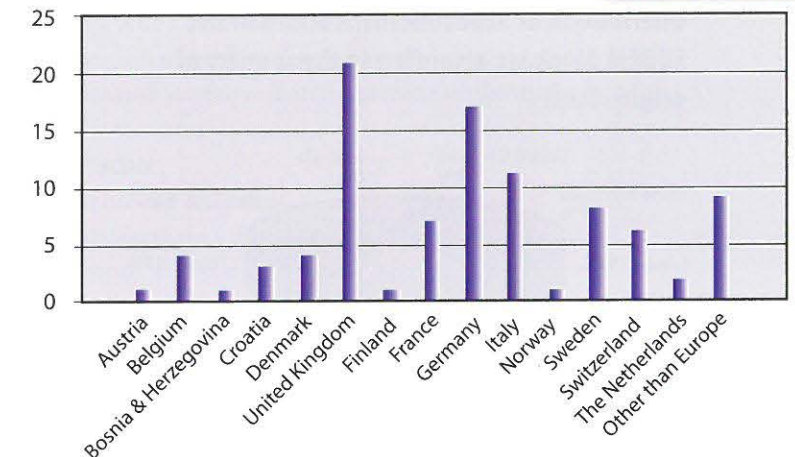
Each interviewee received a short introduction of what our survey consisted of, and its purpose. Consequently, a brief overview of the interviewed organization was requested, followed with a clarification of the involvement in humanitarian demining activities. A brief discussion was held on the past and current activities of the organization. Most emphasis was placed during the interviews on the personal opinion of the interviewee with respect to a certain technologies and practices.

When specific projects not necessarily directly related to humanitarian demining were discussed, we tried to identify the project's aims, maturity of the different technologies involved and corresponding cost estimates, testing procedures; transferability of the developed techniques to different aspects of humanitarian demining, technical specifications of the equipment, performances in certain circumstances, compatibility between different techniques, degree of success in the field, R&D activities and strategies, research funding and commercial perspectives.

### The EUDEM Database

#### Analysis

The overall response rate to the questionnaire



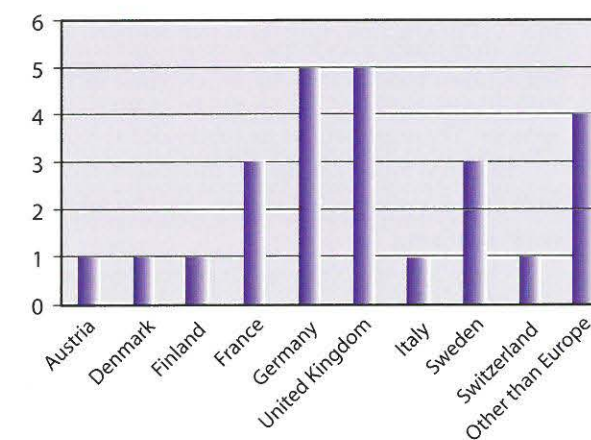
Distribution of entries Graph 1

has been high. The entries were taken into account for the extraction of statistics until the end of May 1999. Out of the 168 contacted organizations, 96 entries were made in the online database at <http://www.eudem.vub.ac.be/>

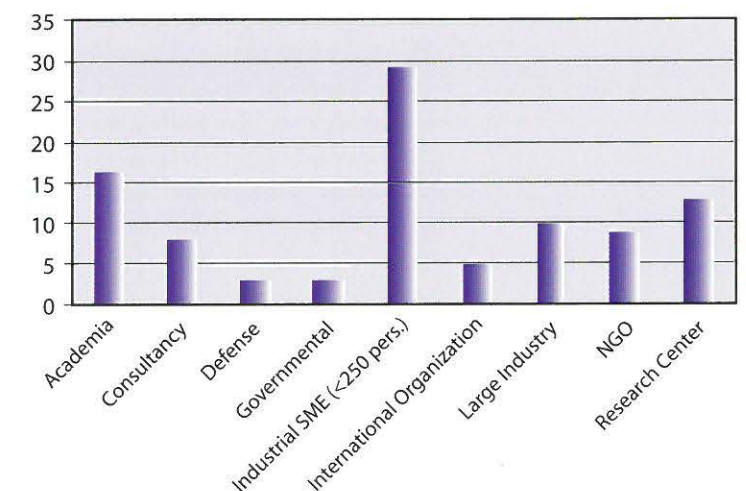
A brief analysis on the distribution of the entries over the different countries reveals the following stated in Graph 1. Note that also nine entries of organizations from outside the EU have been registered. Distribution of entries in the EUDEM database over countries (total: 96)

The greatest number of database entries clearly comes from Industrial Small and Medium Enterprises with less than 250 employees [Industrial SME (<250 pers.)] see Graph 2. These are often not exclusively focusing their production on tools for humanitarian demining. Their willingness to participate in the EUDEM survey may also be explained by commercial agendas. The eight entries labeled "consultancy" in Graph 2 are small companies, mostly created by

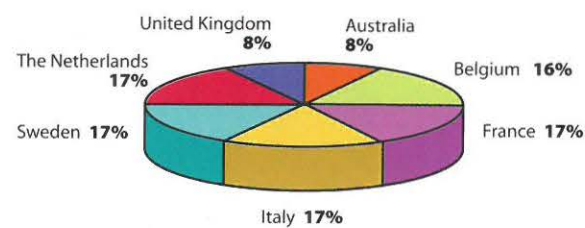
Distribution of industrial SME, by country of origin Graph 2



Distribution according to organization type Graph 3



**Distribution of academic institutions in the EUDEM database according to the country of origin Graph 4**



private consultants. In total, 31 organizations mention consultancy as one of their activities.

The highest concentration of Industrial SMEs is found in Germany (5) and the UK (5), followed by Sweden, hosting 3 Industrial SMEs. (See Graph 3)

Academia (universities) take the second largest share of entries made in the database. This may be explained by their eagerness to participate in collaborative EU research and development projects, their policy of putting results in the public domain through publications and patents and the less stringent constraints to protect their property rights. The densest concentrations of academic institutions involved in humanitarian demining are in the UK and Italy. They each count for 27 percent of the academic organizations involved in humanitarian demining in Europe. Entries are in clockwise order from the top.

Besides universities, research centers have also made a large amount of database entries. The research centers in Europe are mostly located in five countries: Sweden, The Netherlands, France, Italy and Belgium. Although we have made a distinction between universities and research centers, in practice both are often funded by the government, and depend primarily on the countries' strategy for organizing research whether a certain research activity is carried out in universities or in separate research centers. The last two graphs show that the EU hosts a large independent research potential, compared to the industrial involvement.

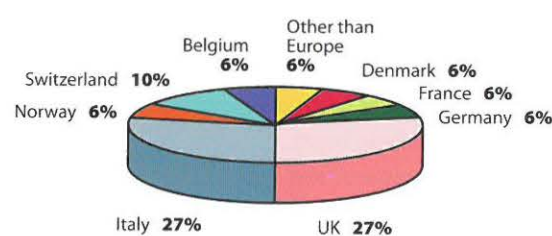
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**Types of organizations and number of corresponding interviews Table 1**

Organizations	Type	Interviews
Industry	Equipment manufacturers (for humanitarian demining)	6
	R&D	9
Operators	NGO	3
	MAC	4 (Geneva, Croatia)
Research centers	Commercial	2
	Supra-national	2 (ISL, JRC)
University laboratories	National	7
	Government agencies	4
Government agencies	MOD, Foreign Affairs, Development Aid	5

**Distribution of research centers entries in the EUDEM database according to country of origin Graph 5**



**Involvement in humanitarian demining**

The 87 European organizations that filled in the "type of involvement in demining" field are all mentioning mine detection, some combined with clearance/destruction and survey/mapping. Out of the 87 organizations, 74 percent declared to be involved in mine detection.

**European technologies**

Out of the 87 respondents in Europe, (see Graph 1) only 70 have given information on technology studies. The nine organizations outside of Europe are not taken into account. The numbers given in this section should not be taken as absolute numbers. We find the highest focus on the Ground Penetrating Radar (GPR) technology, declared by 20 organizations. The second highest was the Metal Detector (MD), mentioned by 15 organizations.

**The State of Humanitarian Demining**

The organizations and individuals we encountered include industrial companies, operators, key research centers, university laboratories and government agencies active in humanitarian demining, as well as some organizations not yet active in the field but showing relevant interest and innovative ideas. We concentrated mostly on detection, and partly on clearance and destruction equipment technologies; other aspects of the mine action process were investigated with the operators themselves, and some government agencies. The organizations are subdivided as follows:

EUDEM found a myriad of equipment, ranging from dogs to technological systems, used for humanitarian demining.

The following table shows the technology, and the correlating maturity and cost. We added comments to clarify the aforementioned fields. Technological "maturity" should be interpreted as a qualitative measure expressing a mixture of the: state of advancement of the R&D; demonstration of detection capabilities use-

ful for humanitarian demining; and demonstration of building a practical system. "Cost" includes technological cost only, and does not take into account the actual productivity in the field. (See Table 2)

**Conclusions and Discussions**

The EUDEM report is a summary of EU humanitarian demining technology, products and practice. Sometimes the conclusions reflect personal opinions of the authors, and some of them had to be simplified leaving out nuances in order to make their message clear. For detailed information and the origin of the individual conclusions, the reader is referred to the information coming from different sources in the original report and its annexes.

The conclusions, are classified in three categories: "policy," related to organizational and coordination aspects; "practice," related to currently used demining technology and procedures; and "technology," related to R&D for new technologies, specification of equipment and testing.

**Policy**

*Equipment procurement (agency)*

Several NGOs have stressed the need for new technology to speed-up current demining procedures, but they are often reluctant to invest. Each circumstance requires specific logistics, campaign organization and equipment, and as a consequence not all existing equipment is continuously in use. Investment in equipment maintenance is also too high. The concept of an Equipment Procurement Agency, acquiring, organizing and maintaining a central pool of equipment, could form the basis of a solution to meet the market requirements. Work on setting up such an agency is currently ongoing.

*Information sharing*

Apart from the normal protections of industrial property rights, we have found many government-funded projects for humanitarian demining purposes which are not releasing any of their results to the public. This resulted from the early military involvement in the domain. For example, many classified NATO reports could bring the development of new technology, the assessment of usefulness of certain techniques and the standardization of testing protocols.

*EUDEM database*

The EUDEM database is an attempt to give an overview of European humanitarian demining. It could serve as a common data repository and a practical search tool for all participants in the demining sector, simplifying contacts and favoring joint efforts. Maintaining the availability of the EUDEM database

requires effort, continued over a number of years. Information sources on humanitarian demining can be consulted via the Internet, but most of them repeat the same topics.

**Practice**

*Mine dog programs*

Although the use of dogs is far from being a perfect science, well-run dog programs have managed to convince skeptic deminers. The use of dogs is approved by most humanitarian demining organizations for area verification and mine-field delineation purposes, which allow important time gains compared to manual clearance operations and quality control after mine-clearance activities.

*Mechanical systems*

An evolution is observed from mechanical demining towards mechanically assisted demining adaptable to local circumstances. Machines usually have to be backed-up by some manual method. These systems are employed for mine verification and area reduction tasks, as well as clearance of actual mine fields. Large mechanical systems require substantial investments.

*Humanitarian vs. military objectives*

It is important to understand that mine detection and mine-field delineation technology is based on military operational doctrine, compared to humanitarian or post-conflict requirements.

**Technology**

*Input from other domains*

Military procedures and technology have influenced the field of humanitarian demining. Other domains are also providing new insights, such as non-

*continued on page 73*

**Table 2**

Sensor technology	Maturity	Cost	Comments
Dogs	H	H-HH	Used in practice
Prodding/Excavation	H	LL	Used in practice
Magnetic devices	H	M	Used in practice (Magnetometers, Gradiometers)
Metal detectors	H	L	Used in practice
Metal detector Array	H	H-HH	(Used in practice?)
Passive mm wave	L-M	HH	EU HOPE project claims low cost Handheld multisensor probe including radiometer Cost figure based on lab equipment Cost is decreasing
mm wave radar	L	HH	
Passive infrared	M-H	H	
Polarised infrared	M	HH	
Multispectral	L	HH	
Ground Penetrating Radar (GPR)	H	M-H	
Ultra-wideband radar (UWB)	L-M	H-HH	
GPR Array	M-H	HH	
Nuclear Quadrupole Resonance (NQR)	M	H	
Thermal Neutron Analysis (TNA)	M	HH	
Fast Neutron Analysis (FNA)	L-M	HH	
Ion Mobility Spectrometer (IMS)	M	M-H	
Biosensor	M-H	M	

*Table 2 (Qualitative) Maturity and Cost evaluation for the previously mentioned technologies. Maturity indication ranges from Low (L) to Medium (M) up to High (H); Cost indication uses L » 4000 EURO (price of a high end metal detector), M » 2 to 5 times L, H » 5 to 10 times L, and HH » 10 times L.*

# Knights in Armored Vehicles

## The HALO Trust in the Caucasus



One of the HALO teams.  
Photo c/o HALO Trust

by Richard Boulter

The demise of the Soviet Union and the resultant rush to establish claims over disputed areas and to assert ethnic identity led to a widespread call to arms. Nowhere was this more the case than in the Caucasus. The former southern Caucasian "soviets" of Azerbaijan, Armenia and Georgia have all asserted their independence from Russia and all have witnessed bloodshed resulting from inter-ethnic fighting. In the north Caucasus there has been fighting in Dagestan, Ingushetia, North Ossetia and most notably in Chechnya. The virtual abandonment of former weapons stockpiles accompanied by some very definite mischief by the departing Russian troops has led to munitions, including mines falling into the hands of almost every potential warring faction. To no one's surprise the region has been troubled ever since Soviet domination ceased.

The roots of the problems in the Caucasus predate the beginning of this century, but Stalin in his role as "People's Commissar for the Affairs of Nationalities" made some decisions which he would have known would fuel long term strife. His policy of divide and rule worked for his tenure in office, but even before the collapse of communism there were signs of impending trouble; by 1989 the dispute over Nagorno Karabakh had re-emerged and Abkhazia had asked to leave Georgia. Although fighting has

recommenced in Chechnya, most of the inter-ethnic fighting took place in the period 1990-95 and the borders of the Caucasus are by and large the same as those of five years ago.

Ten years after the Soviet Union was disbanded, some semblance of order is now emerging in the region and the process of mine clearance is well under way. The HALO Trust began its mine clearance work in January 1995 with a training program in Nagorno Karabakh. The program, which had an initial expatriate presence for 18 months, aimed to establish an indigenous mine action capacity that could carry on the work once international support was withdrawn. This was then followed by mine clearance programs in Abkhazia (Georgia) and in Chechnya. In each of these places in the Caucasus, HALO has been the sole mine clearance operator, which has led to HALO taking the lead in other areas such as mine awareness and in establishing mine information centers.

Each of the programs is now described in some detail to give the reader a broader perspective of the particular challenges and rewards that the Caucasus present.

### Nagorno Karabakh

Despite long standing historical claims and being largely populated by Armenian speaking Christians, in 1923 Stalin decreed that Nagorno Karabakh



Cover of a mine awareness book distributed by HALO Trust.  
Photo c/o HALO Trust

would become a part of Muslim Azerbaijan. The Armenians contested this resolution throughout the 65 years of the Nagorno Karabakh Autonomous Oblast's existence. In 1988 following the submission of an 80,000 name petition, the Oblast Soviet of the NKAO appealed to the Supreme Soviets of the USSR, Azerbaijan and Armenia to allow them to secede from Azerbaijan and be attached to Armenia. Baku rejected the appeal and shortly afterwards violence broke out, initially in the form of a riot on the streets of an Azeri town, but the deaths of two Azeris in the riot led to a pogrom. The situation deteriorated until July 12, 1988, when the NKAO Oblast



Demining a former children's playground.  
Photo c/o HALO Trust

Soviet took the decision to leave Azerbaijan and join Armenia. Soviet troops were deployed to Karabakh to suppress nationalist sentiments, which they managed to do until 1991 when the Soviet Union broke up. Azerbaijan, Armenia and Nagorno Karabakh all declared their independence and held elections. At this point the Azeri Soviet began its attempt to re-establish control over Karabakh and between 1992 and May 1994 fierce fighting claimed around 40,000 lives. The fighting involved extensive use of armor, artillery and aircraft, as well as the laying of many barrier mine fields. Aerial sub-munitions were dropped across the entire region and are still uncovered on a regular basis.

In May 1994, a cease fire was brokered which was confirmed in writing by Armenia and Azerbaijan in July 1994, six months later The HALO Trust commenced its mine clearance program in Karabakh. HALO opted to work with the Karabakhi military Engineering Service as they were already engaged in mine clearance work. This department provided the best hope of the work continuing after HALO departed.

Working with the Karabkhis HALO set out to:

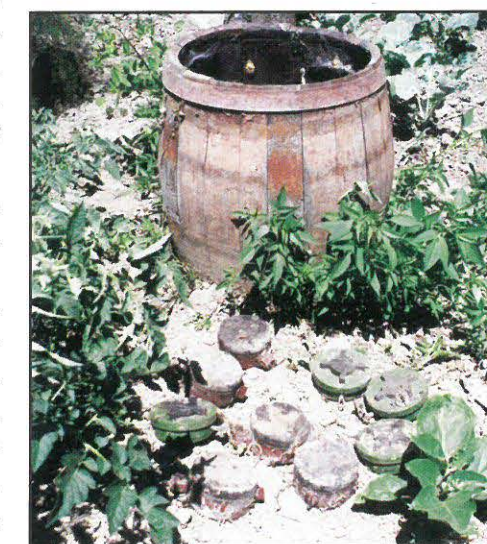
- Establish a complete mine-clearance organization that can be used as the basis for expansion by the authorities.
- Create competence in the technical disciplines of mine clearance, EOD, mine field database management, reconnaissance, survey and marking, public education and the running of a telephone emergency service.
- Train a local management structure.
- Create conditions and systems that are sustainable by the authorities.

HALO's expatriate team had the experience of other HALO mine clearance and survey work in Afghanistan, Cambodia, Mozambique and Bosnia. The team achieved its set aims within 12 months of commencing work, and for the last six months of the program the expatriates adopted a watching brief. The team left Karabakh on June 30, 1996.

In 1999, HALO personnel returned to Karabakh to assess the performance of the local capacity and to seek out weak areas where HALO might be of renewed assistance. The monitoring team was delighted to see that despite no outside support whatsoever, mine clearance was still tak-

ing place on a daily basis and that almost all of the structures originally established by HALO continued to operate in the manner originally intended. Of course, the team did find requirements for support, principally in the refurbishment and replacement of some very tired (through good use) demining equipment, but by and large the results of the monitoring mission were extremely pleasing.

HALO is now injecting some additional support to the Mine Action Center in Stepankert. The provision of new powerful computers and mapping software will greatly enhance the capacity of the center to disseminate clear information. Protective visors that have seen daily use for more than four years are in need of replacement, and broken electronic items such as radios and detectors are being returned to their manufacturers for repairs which were beyond the capacity of the Karabakhi personnel. The Nagorno Karabakh Mine



Nine AP mines in Abkhazia which had been stored in an open barrel in a tomato patch for six years.  
Photo c/o HALO Trust

Action Center will continue to collate and disseminate information, to provide equipment and technical support and to direct and coordinate mine clearance and UXO work in much the same fashion as any other MAC aims to do, the difference in Karabakh is that it all happens at rates which the host government has been able to sustain.

### Abkhazia

Abkhazia is a secessionist republic that lies along the eastern shore of the Black Sea. The Abkhaz fought an 18-month war with Georgia in 1992-23, that saw heavy fighting and the widespread use of mines. Since the conventional fighting ended, limited partisan activity has continued especially in the southernmost Abkhaz region of Gali. Mines can be found throughout southern and central Abkhazia but the major concentrations were laid in Sukhumi (the modern day Abkhaz capital) along the south bank of the Gumista River (the Georgian forces' northern front throughout most of the war).

Mines were also placed on the north bank of the Inguri River (the present *de-facto* frontier and Abkhaz forces southern front since the end of the fighting) and along the M27 corridor, the Main Supply Route for the Georgians during the war. The HALO Trust began its clearance program in Abkhazia in November 1997. This was achieved only after many months of negotiations with both parties to end the conflict and only after an agreement was made which pledged clearance activities would be split on an equal basis to support both Georgian and Abkhaz interests. The clearance was originally supported by the British and German governments and by Fondation Pro Victimis of Geneva, but since then the program has further been supported by the Dutch and Japanese governments. Additional support has been pledged by both the American and Canadian governments, which will enable HALO to expand its program to employ around 300 Abkhaz/Georgian personnel.

The program in Abkhazia addresses all aspects of the mine problem. HALO has established the Abkhaz Mines Action Center (AMAC), which produces high quality maps of the mined areas and conducts Mines Awareness training in the Russian, Georgian and Abkhaz languages. AMAC also coordinates clearance activities and acts as a conduit for all requests for clearance and survey work. Mine clearance is conducted by both manual and mechanical means. The mechanical clearance is being conducted using specially modified Medium-Wheeled Loaders which were a gift from the British Government's Ministry of Defense. HALO's specialist instructors have trained local EOD personnel in the use of relatively sophisticated tools such as rocket wrenches and de-armers which have allowed them to deal with all items of ordnance used in the Abkhaz conflict, the largest of which were 500kg air-dropped bombs. The team have now been asked by the Abkhaz authorities to deal with a stock of SA2 missiles and the disposal of these large items will commence shortly.

Clearance in Abkhazia has benefited enormously through the provision of maps made at the time of the conflict which have been given to HALO by the former combatants. Many of these maps are of exceptionally good quality and give a very clear indication of where to start looking and what to expect to find. The maps also give a very good indication as to the scale of the problem throughout the country. For example, the maps indicate that only around 5,500 mines were laid along the main Georgian front line, and overall indicate that the total figure for mines used lies somewhere in the range of 15-30,000. This is still a lot of mines but a long way short of the figure of 1 million that was proclaimed by several leading international agencies in the mid-1990s.

The mine clearance teams in Abkhazia have so far concentrated on the clearance of the mine concentrations in Sukhumi and Gali. HALO expects to finish the Sukhumi (Gumista River) clearance work this year, but the occasional use of anti-vehicle mines on routes away from the major highways has hindered clearance in Gali. HALO is planning to commence a new U.S. government-funded clearance program in the Ochamchire region of Abkhazia. HALO believes that all the mines in peaceful Abkhazia can be cleared within five years, but the full clearance of the Gali region will not take place until a lasting peace settlement has been agreed upon.

### Chechnya

Recently in the forefront of the news, Chechnya had been home to a HALO Trust mine clearance program since 1996. By the time of the recent Russian invasion, HALO had established both manual and

mechanical mine-clearance teams, trained a UXO capacity and had conducted a full survey of the entire republic. HALO had based its operation in the southwest of Chechnya, scene to much of the fighting and relatively far more secure than Grozny. HALO was in the final steps of the hand-over of full management responsibility to Chechen personnel when the present fighting broke out.

The recent fighting has caused HALO to suspend its activities but should the Chechens achieve a settlement, there is every likelihood that HALO will return immediately to carry out the much needed emergency work. Indeed, HALO kept personnel in Chechnya for as long as was thought reasonably safe to do so, with the last clearance work of hazardous ordnance taking place as recently as December 1999.

For most of 1998 and the first half of 1999 HALO was the only international agency with a permanent presence in Chechnya and so became a much valued employer. The respect for the nature of the work undertaken afforded some measure of security for the expatriate personnel. HALO found far fewer mines in Chechnya than in other regions in the Caucasus; the typical Russian unit would post a couple of OZM 72 bounding fragmentation mines around a road checkpoint to deter would-be aggressors, but very few barrier mine fields were laid. As for the Chechens, they were too poorly equipped to lay major mine fields but they did make

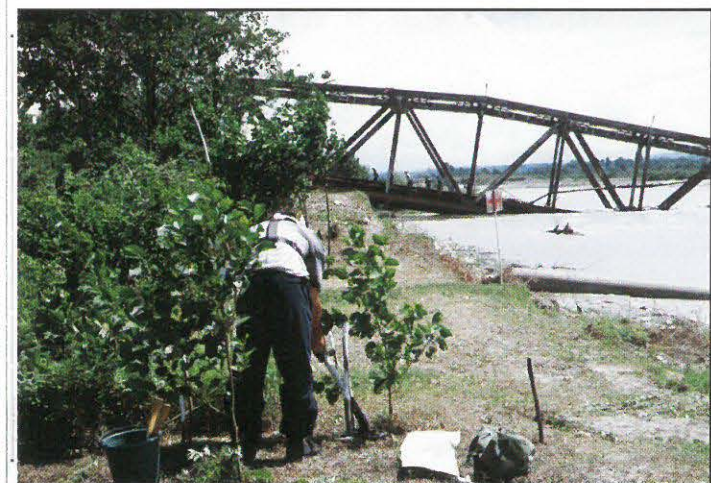
good use of the resources they had and mines very much played a part in their tactics. Despite low mine numbers overall, the perceived threat of mines, based largely on a history of accidents across Chechnya, did deny vast tracts of agricultural land and destroy a significant proportion of the working tractors that still operated in Chechnya. To help address this problem of low mine numbers over vast areas, HALO deployed Pearson rollers pushed by a Belarus (locally manufactured) tractor, which HALO had armored in the United Kingdom. The tractor/roller combination proved a great success and large tracts of agricultural land were quickly returned to productive use. HALO also deployed Volvo Medium Wheeled Loaders to Chechnya to clear the unexploded ordnance that lay buried in the rubble of former housing.

The recent conflict has almost certainly seen the deployment of additional mines and unexploded ordnance. Just how the Russians have deployed their mines is yet to be seen, however they did drop PFM-1s over the Georgian border area of Omalo last summer, so there is little doubt that they will have shown much reserve in Chechnya.

In the Caucasus, HALO has shown that wherever there is a well-educated, computer literate local population, it is possible to quickly and efficiently establish an effective and appropriate Mines Action Center at costs that can be sustained by the governments of mine-affected countries. ■

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*Demining on the north bank of the Inguri River. In the distance, refugees are returning to Abkhazia.*

Photo c/o HALO Trust



*An anti-tank mine awaiting demolition in Chechnya and a FAB air dropped bomb in Abkhazia. The locals had attempted to destroy the bomb by shooting it.*

Photo c/o HALO Trust



*An armored Belarus tractor fitted with Pearson Mine Roller which HALO used in Abkhazia and Chechnya conducts an area reduction.*

Photo c/o HALO Trust



# The PROM 1

## Waiting in the Ground for the Deminers in Kosovo

by Al J. Venter

**The PROM-1 is a deadly and menacing anti-personnel mine, even as it lies partly on its side. This mine has killed or injured more clearance personnel in the Balkans than all other Yugoslav mines combined.**

The PROM-1, the worst in bounding anti-personnel mines and not much bigger than a beer can, is a vicious weapon whose shrapnel can penetrate almost any body armor. It cuts through the average Kevlar helmet like cardboard, as it does often enough for those who try to clear these deadly little bombs, and Kosovo is full of them.

There aren't many mine clearing specialists working in the Balkans who don't have a favorite story about the PROM-1. When one of the teams working there is lucky enough to spot one of these bombs before it finds them (and sometimes there are several, usually laid in clusters) the word is whispered down the line. Most of those on the ground will wait to see what action is taken. Obviously, all mines must be cleared, and that's official. How this is done is what focuses the mind; those working with the stuff know that the PROM-1 is a killer.

After Dayton, there were a lot of casualties among those trying to clear PROM-1s. In the words of one American specialist, "They're a bitch to disarm. We just like to blow 'em where we find 'em." PROM-1s are not so easy to spot, especially when the ground is thick with grass and shrubs, as it is in the summer in Kosovo. The business part that protrudes above the ground isn't much bigger than a matchbox.

In recent years, during the course of a succes-

sion of Balkan wars, it quickly became apparent that most PROM-1s were so unstable that the only way to handle them was to destroy the mines on site. Anything else was invariably a disaster. You only need to brush against any one of the device's tiny prongs and it's over. A bounding mine hurls the bomb a couple of feet into the air and kills everything nearby.

According to Col. Richard Todd, a 23-year American Special Forces veteran with experience in mines and ordnance dating back to Vietnam, you have about a 60 percent chance of being killed if you are within 50 yards of the explosion. "It happens so fast," he said, "that most aren't even aware of what happened." Todd has been working with mines in the Balkans for the past five years and he explained why the PROM-1 is deadly: "Unlike the 'popular' Yugoslav PMA-2, which is the blast mine that you find everywhere in Bosnia, Croatia and Kosovo, the PROM-1 is a group fragmentation mine. It was designed around the original German 'S' mine which caused such terrible damage in WWII and which the Allies notoriously dubbed 'Bouncing Betty.' That's language carried over from the Vietnam era; it's in little use today among mine clearing specialists," he declared.

### License To Kill

"The PROM-1 has a devastating effect when it blows. It is a bit like a proximity fuse on a mortar or artillery shell exploding a few feet above the ground," Todd suggested. "And because this mine can be laid with multiple trip wires, it has become the obvious weapon of choice among the Serbs. They like it because just one PROM-1 can take out a group of people, or even a squad of soldiers on patrol," he continued. "In recent years," said Todd, "it was increasingly deployed in urban areas. They've been laying them in Kosovo as if they've a license to do so," he said.

Small as it is, the PROM-1, a bottle shaped, ol-

ive green, cast-steel mine, is a complex device. Designated in the textbooks as a "buried, tripwire-activated bounding anti-personnel fragmentation mine," it weighs a little over six pounds. Its single pound of explosives is a combination of Trotyl and RDX in

### Yugoslavia: One Big Mine Field

Almost all the countries that once comprised the old Yugoslavia and that have seen military action in recent years have problems with mines. In parts of Bosnia, it is still dangerous to venture off the road.

about equal proportions. The fuse contains an integral percussion cap "which is what makes it so damned unstable," said one authority. Most of the people who have tried to disarm it have come short fiddling with the business end.

There is controversy about its plastic coated tripwire. Some say dogs can detect it and others reckon they can't. Usually the same color as the terrain, tripwires are difficult to spot under the best conditions and in Kosovo, the Kosovo Liberation Army has had major problems because of the foliage. A proportion of the casualties taken by the guerrilla group before the Allies went in was from mines, some PMA-2s but also PROM-1s.

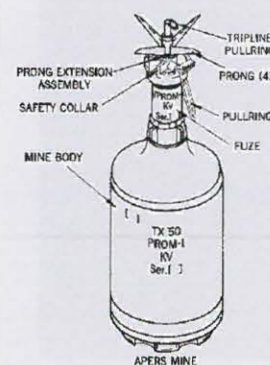
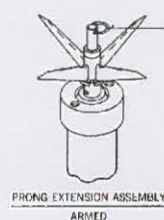
The problem is that once tripped, it is impossible to differentiate between the small blast that lifts the bomb out of the ground and the full effect of the explosion, which is devastating. Someone in Angola who once had an armored vehicle trip one in front of him said that both blasts were simultaneous. Any hope of evasive action, consequently, is impossible. More uncommon versions of the same mine such as the PROM-1P and PROM-2 tend to bound a little higher, but they have the same devastating effect.

"Some mean weapon, and not to be trifled with," Todd warned. He heads the U.N. Mine Action Team in Zagreb and has files full of PROM-1 incidents, a lot of which make for some pretty grim reading. Despite multiple warnings, casualties with PROM-1s do happen. A crack international mine clearing team working under U.N. auspices in Croatia had one of its members killed earlier this year. Operating with dogs in an area reduction program, the operator couldn't have spotted the one that either he or the pooch tripped. Two shards of shrapnel penetrated his brain in the explosion that followed and he was killed instantly. Miraculously his dog, working only yards away, was untouched.

The same holds for Croatia. A succession of mine fields, some Serbian, the others laid by the Croat Army, stretch down almost the entire length of the country in a half-moon pattern that extends over 500 miles. The mine fields run from Vukovar in the northeast to the Montenegro border. Only the narrow coastal corridor between Sibenik and Sipa remain uncontaminated.

While there are mine fields in dozens of other countries all over the world, those in the Balkans have suddenly acquired a notoriety of their own. What the Serbs did with mines in Croatia and Bosnia, they have

A tractor lies flipped over after its encounter with a mine. Photo c/o Barry Middlemass



repeated in Kosovo. It is also no secret that Croatian mine fields have become the subjects of close study by a variety of NATO security and intelligence organizations.

### Mines At Garage Sales

In the Balkans, the Serbs have been making mines for decades, and their stuff is good. By the early 90s, Yugoslavia was earning \$2 billion a year from



Signs such as this one are common in the Balkans.  
Photo c/o Anthony Robbins/CARE

its weapons sales, mostly from Third World buyers. Even today, it is easy to buy any number of Yugoslav mines in East European arms bazaars.

Like it or not, some mines, like the PROM-1 and the anti-tank TMRP-6 (and TMRP-7) as well as the full range of TMA mines, are as good as anything produced in the West. U.N. mine clearing teams are encountering Yugoslav mines in just about every international trouble spot. In places like Angola, Cambodia, Afghanistan, Ethiopia and Mozambique you find Yugoslav landmines, often in great quantity.

Now that almost every NATO country is helping in Kosovo, landmines are arguably the single most serious obstacles. As someone once said of mines, "They are cheap, need no food, remain silent and inactive (and potent) for years. They also have the ability to do great damage." U.N. mine clearing teams presently working under U.N. or World Bank auspices in Bosnia and Croatia have made a number of observations about Balkan mine fields. Clearing them often involves complex and sometimes fright-

ening problems and some of those doing the work are getting hurt.

There have been fatalities. "There is simply no magic bullet for clearing landmines," Todd says. "In order to do the job effectively, you need to draw from a 'toolbox' of three fundamental disciplines. These are human and mechanical deminers, as well as dogs trained to find them [mines]. None of these assets on its own can do the job properly. You need one to check the efficiency of the other."

Nor are these disciplines free or cheap. "It is expensive to run and maintain a demining operation. The specialists doing the job are expensive and so is the insurance to cover them in case of accident. Similarly, you constantly need to train more people to do the job properly. That, too, costs money," Todd stated.

There are a number of countries clearing mines in the Balkans, all of them involved in seven-figure dollar contracts, which are usually linked to foreign aid. In Croatia, the Russians were followed by Italy, Germany, Israel, the Netherlands, the United States (RONCO) and Mechem of South Africa. There are also at least 12 Croatian firms. This includes Mungos, said to be one of the largest companies in the

world specializing in this sort of work.

Mechem, following contracts in Angola and Mozambique, operates with a project leader plus seven: two team leaders, two dog handles, a driver/mechanic and a couple of demolition specialists. Johan van Zyl runs the show. As he explained, all of his men have good Special Forces military experience and all are trained medics in trauma medicine. "There have been times when these attributes have been handy," he said.

### Roughing It

The men work seven days a week until the contract, in this case 60 days, is complete. To save money, the men live rough, usually starting the day at six and working through to seven or eight at night. They eat before they start and the next meal is usually when they finish for the day. Time lost to rain is made up afterwards.

Operating under contract with this foreign mine clearing team are 40 Croat deminers headed by four team leaders. Additional crews (according to Croatian

**While driving on some isolated country roads around Gospic, we were told that another problem facing mine-clearing teams was a distinct lack of patience among local residents to get the job done. Pointing to fresh tractor tracks on both sides of the road, my guide said, "Quite often the farmers don't even wait for us to complete the job. They just ride around and occasionally they'll trip a TMRP-6 which can reduce a three-ton truck to scrap in an instant." Or their animals will do it for them. The Gospic countryside is littered with the bones of dead cattle and horses. Apparently it is the same in Kosovo where the locals were anxious to get going again before winter set in.**

law) include two each of doctors, medics, drivers, dog handlers and ambulances, plus an interpreter, all of whom must be paid for by the contract company. Other companies are similarly bound by red tape, which most foreign contractors think is a legacy of the old political system. It doesn't take any observer long to see that the majority of ancillary personnel are superfluous and therefore a waste of money.

Foreign mine clearing specialists, with whom I spoke, said that while the quality of Croatian mine clearing was good, their rate of clearance was mediocre; again, reflecting residual communist ways. Almost all the expatriates ventured that if they had been able to bring their own people into the country to do the work, they would have been able to cut much of the crap. Some said that the job would have been completed in half the time.

### Clearing for Cash

There are several categories of mine clearing in the Balkans. The first is humanitarian. Consequently, most effort is invested into commercial projects with economic goals such as the one around Gospic, about 100 miles south of Zagreb. This involves clearing anti-tank (AT) and anti-personnel (AP) mines around the only rail link running from the capital to the southern coastal cities of Split and Dubrovnik.

The problem here was that contractually, clearance only extended to 15 meters on either side of the line, which meant that mine fields fringing the line, some of them many acres, remain uncleared because there was no money. The World Bank gave Zagreb a \$7million loan for clearing the bombs. Because the money eventually has to be paid back, the Croats aren't falling over themselves to get the job done. While the

mine clearing teams have a handle on the job, the civilians who live and work in these areas don't. Their casualties don't even make the papers any more.

### Land Littered by Bones

A few days before I arrived in Gospic, a local was killed after tripping a PROM-1 within a hundred yards of the rail station. He had been walking home from work. A huge hole gouged from the turf was still visible while mine clearers worked around the spot.

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Or their animals will do it for them. The Gospic countryside is littered with the bones of dead cattle and horses. Apparently it is the same in Kosovo where the locals were anxious to get going again before winter set in.

One of the more difficult problems in the central Balkans is coping with heavy bush. After five years of waiting for the mines to be cleared, some parts of

A moment of bravery: a deminer concentrates on cutting a tripwire.  
Photo c/o ICRC



what had once been farmland have become almost forested. Before any clearance work can be done, small trees have to be removed to allow the teams to bring in their equipment.

In some places the undergrowth was so thick it had become impossible to work there. It was also dangerous. Everybody involved in this business knows that mines laid a decade ago don't become inactive with time. Van Zyl was considering hiring a Caterpillar, though he wasn't sure what the authorities would say, or the owners of the machine.

### Signs of Disaster

One of the observations during our visit was that because it lies on a main road heading toward the Dalmatian Coast on the Adriatic Sea, the town of Gospic is often crowded with German and Scandinavian cars heading south for summer. Very few of them are aware that there are mines in the surrounding countryside, and the reason is simple: Zagreb does not allow the authorities to put out any warning signs.

Consequently, said a U.N. official, most people passing through the country and perhaps picnicking en route, have no idea that they might have stopped on the edge of a mine field. "Sometimes I see cars parked with children playing in nearby fields. It's only a question of time before there is a disaster," he intimated.

Most of the mine fields, both Serbian and Croatian, are mapped. Todd made the point that just about every day he received calls from former JNA

soldiers offering him information about old mine fields. "There is a price, of course," he continued. "Some want money, others try to use it as leverage to return to their old homes."

It was notable, travelling about Croatia, that every third or fourth house or farm that we passed had been broken down, burnt or trashed. All had formerly belonged to a very large Serbian community that lived there before the war. Most of the families had been there for centuries. Like Albanian Kosovars, almost all of them had become refugees.

### Postscript

Since visiting the Mechem operation around Gospic, the company finished its contract and in the two month time frame, lifted about 60 mines of which about two-third were anti-personnel. There were no casualties in that time. That contract, though small by international mine clearing standards, was worth \$1.3 million. Mechem has successfully tendered for two more mine-clearing projects, one in the northeast near the Hungarian border which van Zyl reckons is, "A bastard of a job because of all the booby traps," and another close to the Dalmatian coast, west of Gospic. ■

*A.J. Venter went into the Balkans twice during the war: once with the U.S. Air Force in a Joint-STARS operation and again into old Serbian mine fields where he looked at the threat from up close.*

*\* Reprinted with permission from Soldier of Fortune*



*Areas to the left and right of this road are mined.*

Photo c/o Marijana Prevendar/UNA-USA

# Responding to an Emergency

## An Interview with Bob MacPherson, CARE



*Standing on a cleared strip of land, a deminer directs his mine dog.*

Photo c/o CARE.

In an interview with The Journal, Bob MacPherson spoke candidly and honestly about the challenges, successes and lessons learned in effectively responding to an emergency situation. MacPherson is responsible for landmine safety and awareness and is the emergency team leader for CARE. Throughout 1999, he has been in Kosovo coordinating activities so that civilian lives can return to a state of normalcy. Upon finishing our conversation, he was scheduled to fly to Chechnya to try to coordinate relief efforts for that war-ravaged country.

Currently, the Kosovo refugee crisis and the current Chechnya war are vying for first place for the worst humanitarian disaster in Europe since World War II. From March 24, 1999, when NATO began bombing Yugoslavia, until June 10, 1999, when a peace agreement was signed between the Yugoslav government and NATO, more than 1 million ethnic Albanian refugees fled the province of Kosovo. The refugees, many of whom were forced from their homes at gunpoint, crossed over into neighboring Albania, Macedonia, Montenegro and Bosnia-Herzegovina. Hundreds of thousands more were internally displaced within Kosovo's borders.

Building on its existing presence in the Balkans, CARE launched an immediate emergency response, eventually managing eight refugee camps in Albania and Macedonia housing over 100,000 refugees. CARE had been working in the Federal Republic of Yugoslavia since 1993 helping displaced Serb refugees from Bosnia, and in Kosovo. Since 1998 they have been implementing shelter provision and repair, agricultural rehabilitation and mine-awareness training and demining. CARE re-entered Kosovo three days after the first NATO troops and is now working in the Urosevac (known as Ferizaj in Albanian), Kacanik, Lipljan and Mitrovica areas. Over 810,000 refugees have returned to Kosovo from neighboring Albania and Macedonia and other countries. More than 20,000 refugees remain in Macedonia and 4,030 refugees remain in Albania.

by Margaret S. Busé

**"There is no black magic to mine action, just a large dose of funding and integration."**

**—Bob MacPherson**

## Responding to an Emergency

▪ *How long have you been involved with relief efforts in Yugoslavia?*

BM: Since 1994 I have spent much of my time going back and forth, first from Bosnia and then I got involved with Kosovo in the first part of November 1998.

▪ *What were your predominant activities in Bosnia?*

BM: It was totally emergency relief and shelter. It was interesting how things evolved in Bosnia and how by 1994/1995 there were so few strikes in the NGO community and then there was a whole sale rush into Bosnia with mine action and mine awareness.

▪ *In Kosovo have you done mine awareness and demining?*

BM: I am most proud of Kosovo. We do some mine awareness, but predominantly mine action in Kosovo. We use MINETECH and right now we have four teams and that in essence is eight men and two dogs per team. We work generally a corridor from Mitzuvesha to the north to Versia and Urosovich to the south.

▪ *What did you run into in Kosovo that you had not encountered before?*

BM: Easily it was the preponderance of cluster bombs and the sophistication of the NATO weapons. In essence we came in three days after NATO; I had MINETECH on the ground four days after that. One thing I have a lot of pride in is that in Kosovo we took the lessons that we watched other NGOs and other organizations do and applied them. I call it an integrated process and this is by no means a unique or innovative concept, it is just right. What we did right from the beginning is that we focused on shelter. We focused on agriculture and some health, but in the beginning it was shelter. If you could just draw those three areas in a vertical bar. Underneath of that foundation I put mine action and mine awareness because particular in the shelter area going into the remote areas of the country that had been

*“Having that mine-assessment team right there with that shelter-assessment team paid us dividends that were off the page.”*

beat up pretty well, having that mine-assessment team right there with that shelter-assessment team paid us dividends that were off the page. We also employed an emergency explosive ordnance demolition team. So that is how we worked the immediate problems: through an integrated approach. Just by the fact of who you work for, you can show off a lot of times. You can have all the mine-awareness education, but people want to say ‘Thank you very much, we understand the problem but we have a problem right here that we need help with. What can you do for us today-this second?’ This integrated approach has worked real well for us and the communities we are trying to help.

▪ *What type of information could you or your organization have benefited from before you deployed there?*

BM: About as much geographic information system (GIS) services as is possible. I really am big on this. If I could have gone to one central repository and said ‘OK, let’s look at this province from a geographic information point of view. Where are locations for industrial capabilities, agricultural capabilities? Where is the preponderance of forests?’ Forests became a big thing to us for wood and shelter, and then to try to determine where the known mine fields were. To put all of this information together would have been a tremendous help. The shame of it is that information is out there. It is a matter of us sitting down and for us to have that coordinating mechanism. On a positive side, I have never experienced this before; the U.S. State Department deployed their GIS capability into the field. That was an enormous benefit to us.

▪ *How successful was integrating information with the other NGOs operating in the field?*

BM: I have never had a problem. It may be because of the tightness of the community. Organizations that I traditionally work quite well with are the ICRC, NPA and Handicap International. We bump into each other quite a bit and I have an enormous respect for those organizations’ survivor and victim assistance programs, something we don’t do. I go looking for these fellows. HALO, Greenfields, MAGs, the cast of thousands—we all work well together. I may have disagreed with them now and again, but I have never bumped into the competitiveness that some talk about.

▪ *There was quite a media blitz involved in Kosovo. Did that help or hurt you and your organization?*

BM: In my case it is still costing me half a million dollars a month to fund activities. Actually it just went to \$550,000 and the reality is as long as it is positive it helps to focus the public’s attention. Media exposure is helpful. The media sensitizes the donor community to the magnitude of the problem. I get a little concerned sometimes because I think that the Campaign to Ban Landmines, the Nobel Peace Prize, Princess Diana—the reality is now is the time to dig them out from a euphemistic point because it

*“The U.S. State Department deployed their GIS capability into the field. That was an enormous benefit to us.”*

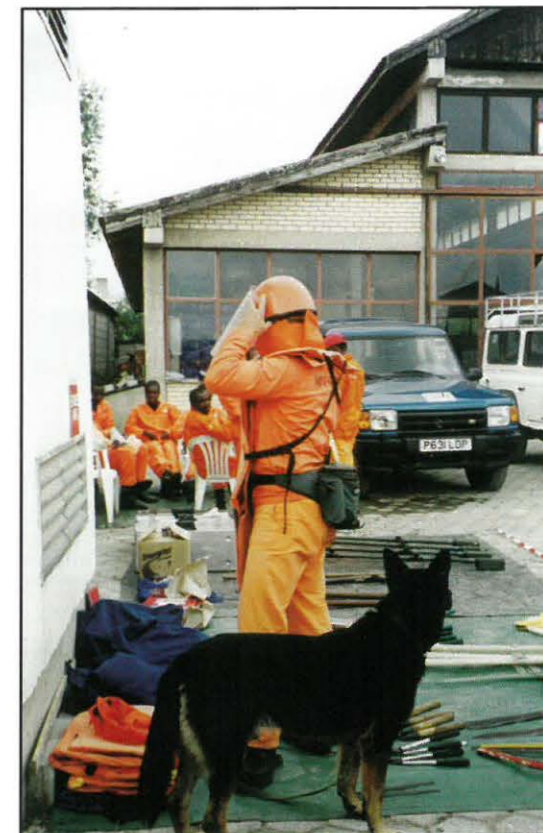
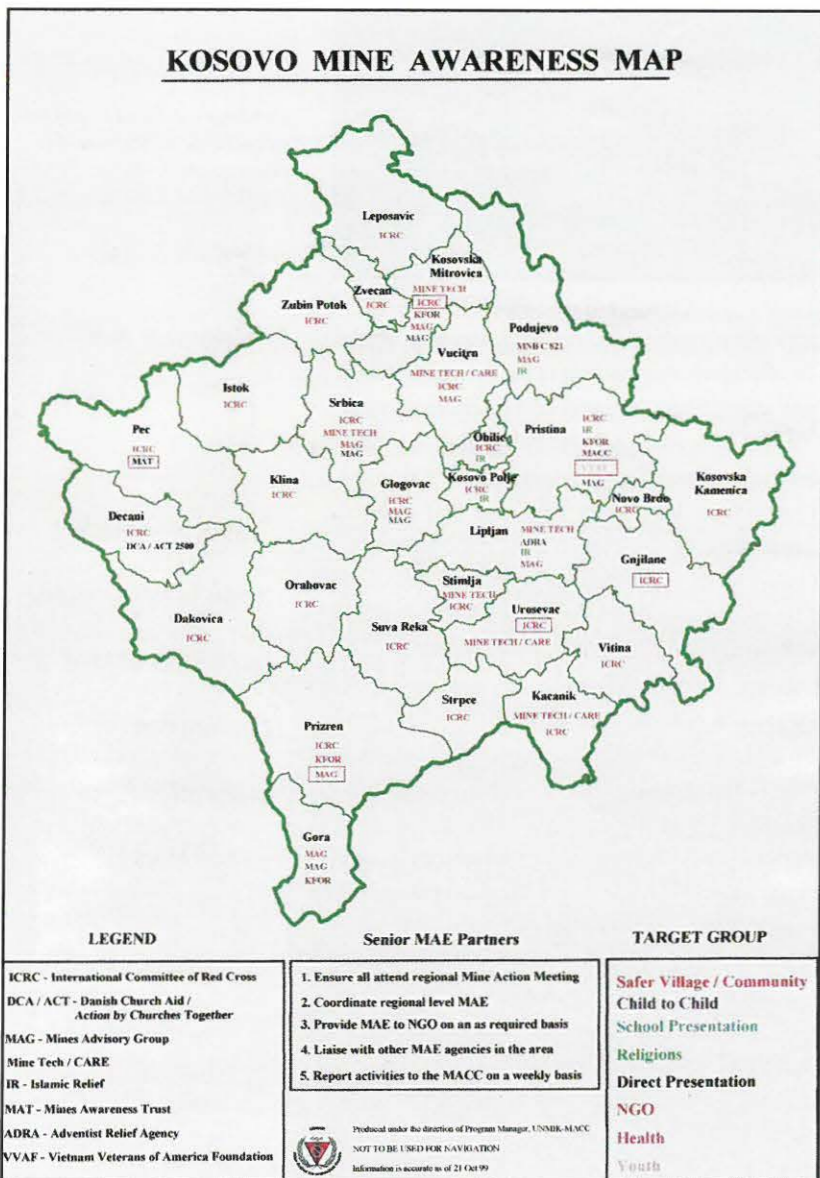
is tough to raise money. I get frustrated. There is an integrated capacity to mine action going on with each of CARE’s programs and that is very important when you are as large as CARE is. I am a strong believer in mine awareness, but I think that the NGO community has to be involved from the mine action side.

▪ *In the actual demining?*

BM: Yes. The problem I have with the State Department is they just gave a \$250 million contract to RONCO over a five-year period. They feel they have worked real well for them on the DoD side and therefore this is a good expenditure for their funds. What they cannot do, which is what we do, is the integrated process of demining, of wrapping the whole process up in relief, transition and development. Because getting money out of the U.S. government is the toughest thing I do. Thank God for the private donor community and some of the European governments. I am not trying to politicize because that just makes it emotional, but I believe strongly that there must be a component of each to make mine action successful. The lessons learned that I have seen with other NGOs is that you can’t do what I call ‘mine initiatives’ which wraps up both mine action and mine awareness.

You can’t do them in isolation, in other words they must be part of the entire relief and development and that is the lesson that I have watched. There is no rocket science to that. I heard one time from Guy Willoughby at a conference in Geneva last year. He made a great point. Too many people think that this mine program at least on the mine action side is a bit of black magic. That there is something more to this than precise execution of a formula. We know how

Map c/o Kosovo UNMACC / Xheraldina Pufja



At the beginning of the long day ahead, a deminer and mine dog prepare for work. Photo c/o CARE

## Responding to an Emergency

to do it, it is slow, tedious and it is expensive but there is no black magic to it and I think we have all come to that over the years.

▪ *So, you think it would benefit more NGOs to get involved in the actual demining because right now, most aren't involved?*

BM: This is obviously something that if you're going to do it, you better do it all the way. So if you are going to commit ... That is the only reservation I have. Sure I would like to see dozens of NGOs out there as long as they are committed professionals and they know what they are doing. Seventy percent of what we do has to be based on the integration within the mine action community and if you want to do this and go at it alone you might as well not bother. Look at the results of an unprofessional approach—this is not something that we can fool around with.

▪ *Do the NGOs share information well?*

BM: The organizations I work with are very professional. If I ask a question of one of them the answer comes back very quickly. I can call my contacts 24 hours a day and I will get an answer.

▪ *You have mentioned the mine initiatives and working with an integrated mine action program. Is that the KIMAP (Kosovo Integrated Mine Action Program) that I saw mentioned?*

BM: In essence I was writing that on the fly. That goes way back. That was a program that I first put together looking for funding for mine awareness and mine action, which I put to the United Nations. What eventually had to happen was I had to break it down into two separate components and seek funding separately for mine action and mine awareness. I just finished working on today the Kosovo Mine

Awareness Project, which is going to the BPRM. What happened in the very beginning, the people who really came to the rescue were the Canadian and British governments for funding mine awareness and mine action. I need funding for the next six months. This program will be submitted to the Bureau of Population and Refugees in Washington for mine awareness.

▪ *What type of time frame does it take to get a mine-awareness program off the ground when you have refugees returning?*

BM: I will answer that in two ways. In Kosovo it wasn't as hard because a lot of other NGOs had done mine awareness in the camps in Macedonia and Albania. To do it right it is going to take two or three weeks to get the right guy. It depends if it is a crisis, but to get the right guys in there to set the thing up is the trick. I am thinking about Albania where we had a dead start. We had a man and woman finally come in and that took two weeks and they were skilled at mine education.

▪ *Were you the initiator for the integrated approach to mine action?*

BM: Yes, and I got funding from Great Britain's DEC. Now thanks to the U.S. Department of State's Humanitarian Demining unit that lead us to the International Trust Fund. We are in essence getting two for one for the money. The drum I keep hammering is what I have already put forth. I am not going to come to Kosovo and run down this road and start destroying mines and have health, agriculture and shelter going on separately. Sometimes it is just as effective to tell people where the mines are not. I am trying to sell this as an integrative process—awareness, mine action, health, agriculture, shelter.

▪ *With this integrated approach, who determines the priority of areas to be demined?*

BM: If you look at the map of Kosovo the 450 documented mine fields that the Federal Republic of Yugoslavia forces turned over to NATO, we had 200 plus in our area. We worked, as all of us did with UNMACC, to work with the coordination of where we were going to position our assets. We finally got some help from MAG and Greenfield in our area.

▪ *What are the successes of CARE's programs in Kosovo?*

BM: Just in the month of September 1999, we cleared 3,068 houses in our area.

▪ *What does that mean?*

BM: That goes back to the shelter requirement, helping people get out of the cold for winter. It means when we had our shelter coordinators moving through an area before they could even go in a house to begin making their assessment, dogs went through those homes to clear them. We had agricultural sights cleared. Dangerous areas confirmed were 31 villages—now that can be one acre or 100. Schools cleared were two. Kilometers of road cleared, 12. Water lines cleared, 54 km. That gives you an idea. This was the first time CARE was on the ground from the beginning. We took some of the lessons learned in other places and from what other NGO's have told us.

▪ *How did you come about being so well prepared this time?*

BM: We spent November through March out there. I never thought it would come to bombing, but I watched this war being fought by the KLA and the Federal Republic forces. At that time UNICEF and CARE were going to implement a Kosovo wide mine-awareness program in April, just before the kids got out of school. I was really tuned into the existing problem of UXO before the bombing started and because of my previous experience in Bosnia, I knew that the Serb army was pretty good about documenting landmines but the splinter militias were tough. I spent 25 years as an U. S. Marine officer and I know for planning purposes that 10-15 percent of all munitions that are dropped are planned for malfunctioning. You didn't have to be too smart to put all those figures together. That is where my preparation came from.

▪ *Where do you see the future of CARE's programs in Kosovo?*

BM: CARE will be there for the long run for mine action and mine awareness.

▪ *When will some type of return to normalcy occur?*

BM: This is my opinion: I believe it is contingent on getting people through this winter with adequate shelter and then getting a decent crop planted in the spring of 2000. Stabilize the population for this winter. For spring, summer and fall it will be major infrastructure assistance and getting crops in the ground at the same time.

▪ *Do you think enough land has been cleared for that?*

BM: I don't think the landmine problem was nearly as bad as the UXO problem. While I was still out there the U.S. government declassified documents that showed where they dropped the clusters.

▪ *How much of the agriculture and livestock were damaged by the war?*

BM: If you could find a cow out there you were lucky. The problem was farmers were so anxious to cultivate their crops they were out there before areas had been cleared.

▪ *What are your future activities?*

BM: I will probably be headed to the Caucasus by the English Republic to look at the situation with refugees coming out of Chechnya. I coordinate emergency response and landmine integration. With 250,000 refugees down in the Caucasus that is something we need to look at. I tell you, you can't monitor things from Atlanta, Georgia you have to be there on the ground.

▪ *There are not a lot of NGOs operating there.*

BM: It is tough to get to there and it is quite a dangerous area and that is part of what I am going down there to look at. I am heading out there to see what CARE can do for the people there.

▪ *How do you get your job done amid all the hardship the people are encountering?*

BM: I am certainly moved by the hardship and I am a compassionate person, but when it comes to getting relief and emergency supplies out you have to stay apolitical, and I can't let my mind start thinking about who did what to whom. It is like going into combat in the U.S. Marines. I was an infantry officer and I started in the Vietnam War; if you let your emotions take over that is when you get people hurt.

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MacPherson, Taiwanese ambassador, Lionel Dyck of Mine Tech, Tonkee, site manager.

Photo c/o CARE



# HELP ON THE WAY . . .

## The Slovenian International Trust Fund for Demining

by Stephanie Schlosser

On the web page of The Slovenia International Trust Fund for Demining (ITF) there is an image that, at first glance, could be an advertisement for a toy store. The image is of a child's doll. She appears bright and happy, with red ponytails and yellow ribbons, and a sunny yellow dress. The doll's eyes glance playfully to one side, as if she is about to join a group of similarly happy friends. Suddenly, the doll's face and body change. With web animation, the doll's right leg disappears along with her smile. Then you remember, this is a website for ITF and its focus is demining. The doll herself, you realize, must be a landmine victim, happy one minute, and completely changed for the rest of her life the next. The image sticks in the mind.

ITF keeps the doll as a symbol of the many people in Bosnia and Herzegovina (BiH) who have been hurt by landmines. With the main goal of ridding BiH of its landmines thoroughly and quickly, ITF operates by donations, including Slovenia's own \$1.3 million for startup activities. The director of the ITF, Jernej Cimperšek, does not find it easy to use the doll as a symbol.

"You know, I personally have problems with that because I am also a father; I have two daughters," Cimperšek said. "Using that kind of advertisement, it could be good or bad, you know? But I'm very happy with the website, with the doll. I also have a lot of meetings with those kids in Bosnia, Croatia and Kosovo, without legs, without arms and it's completely different if your kids [are] practically the same age, but of course it's what the donors want to see." The donors of whom Cimperšek speaks are those countries, companies and individuals who want to see BiH become landmine-free. It seems that in or-

der to keep people interested in the cause of landmines, the drastic but real effects of landmines have to be the focal point. The United States matched donations from 1998-99 with \$14 million, but fervency for giving may not last as long as the landmine problem does.

"There are a lot of changes in the donors' decisions as to where they want to place their money, we are afraid that the donations will go down and not up. So, we are trying to talk with Bosnia to show them that sooner or later they must collect some money for the problems in their country," Cimperšek said. The partnership between BiH and ITF is as important as the demining itself. One of ITF's main goals is to help BiH become its own best source of aid. ITF has already taken many steps to help BiH start their own demining process.

"First of all, in the structure of the Slovenia Trust Fund, in the managing board, their are also Bosnians; so they are in the decision making part of the Trust Fund. They are included," Cimperšek stressed. "Also, in our office in Sarajevo we just employ the local people. We don't send Slovenians or some foreign experts to work there because I think they [the Bosnians] are quite able to do it, they have enough knowledge. Maybe they need [to learn] something more about management or maybe something more about financing, but in general they're very good experts and there is no need to send experts from abroad to Bosnia and Herzegovina. So, that's the start of how we want to work with them. Hand in hand we are partners, not teachers to show them something, they just need some kind of help." ITF has already shown its commitment to making BiH a self-sustained demining community, when asked where ITF gets its deminers Cimperšek stressed, "Local! Local! Bosnia and Herzegovina already had more than 1,500 trained deminers; some of them were already trained by the state department money so there was no need to train new ones. The main problem we have is to have

# IT'S ALREADY HERE

enough money to pay them, those who are already trained to work in the fields."

In 1999, 10.1 percent of donated funds went to victim assistance. Helping prevent the tragedies that create new victims is ITF's first task, but the Trust recognizes the simultaneous and immediate need for healing among the war-torn people. Many mine victims receive treatment in Slovenia at the Slovenian Institute for Rehabilitation, but keeping in mind the need to establish BiH's own systems, the Slovenian Institute established the Center for the Rehabilitation of Mine Victims from Bosnia and Herzegovina in 1998. Offering assistance to about 250 patients annually, the institution's program has two parts. The first is the rehabilitation of mine victims, which will include 25 patients from BiH per month. The second involves building up the program by educating doctors, specialists and technicians from BiH. Demining, however, still remains ITF's central focus.

"Demining, really is the main problem in Bosnia because there is not enough money for resources and it's better to demine than just have a program for victim assistance," Cimperšek said. "In general, our policy is that not more than 15 percent of our funds will go for mine victim's assistance, [leaving] 85 percent to demining, but last year [in] all the program not more than 10 percent of our money went to mine victim's assistance. There are a lot of victims in Bosnia and Herzegovina, and we also work in Croatia. There are a lot of victims who need some kind of help but in general, it's the same as in the demining program; we have a memorandum signed with both entities in the Ministries of Health, so there are those patients who need to go to Slovenia and [those who] could be in Bosnia-Herzegovina. At least 40 percent of the program was in BiH, not outside of BiH. I think that's the right approach. To teach them we have some special courses for trainers, for those medical people in Slovenia or in BiH, so sooner or later, maybe five years, they will not need our help anymore."

With a country like Slovenia, which finds itself deeply immersed in the mine problems of a neighbor country, there had to be minimal landmine problems in order for the country to act as Samaritan.

Cimperšek explained the landmine history of Slovenia, "The experience [in demining] in Slovenia is quite long because we have an experience from the first and from the second World War, and we have a group of experts who worked in disposal of munitions for, I think, 30 years. After the return of the Yugoslav army in 1991, they left a few [mines] in Slovenia. We had our so-called demining corporation in '92 and finished in '93. It was not a big operation, it was a small one, but of course we have some experience in mine clearance after 1991."

Even with some un-cleared landmines of its own, Slovenia and ITF see their role in BiH as important and even seek to help other countries directly or by being a model.

"I think it's important for Slovenia, because 10 years ago we were together, to show the others, our former—we call it brothers—of course that there is opportunity for them to be normal countries, to join Western Europe and Western countries in the world," Cimperšek said. "I think it's very important from a Slovenian point of view to show, because our role can be in Europe not just in the Balkans, that we can work to show new approaches to the Netherlands or the United Kingdom. We can go to the regions where we have experience. We speak their language, we have the same culture, religion and all of those things so it's important for us to work in the region. I think it was a very good decision of the Slovenian government to establish the Trust Fund and to help those our former republics, which are now former Yugoslavia."

Moving forward is in the plans for ITF, the Trust has planned to tap into the private sector for funds in the coming century.

"Our main thinking, our plan for 2000," Cimperšek said, "is to work with the private sector because last year our main goals were [to get donations] from countries. Now we are starting to work with the private companies, private donors. We have our own PR agency that works for us. I think they are quite successful. We have now some programs



The "sad doll" represents people who have been hurt by landmines.

Graphic c/o International Trust Fund



The "happy doll" is a symbol of hope and healing.

Graphic c/o International Trust Fund

## HELP ON THE WAY . . .

with lottery clubs and some of our companies in Slovenia have already sent some money to the Trust. I think the future of demining, especially in this region, is now the private sector. With countries, there are other political parts of the world which are more interesting for them and they will go and send their money somewhere else, but [we would like] to es-



The ITF headquarters are located at The Training Center for Civil Protection and Disaster Relief near Lubljana, Slovenia's capital.

Photo c/o International Trust Fund

establish the local economy so that it could be more able to [donate] to the Trust fund. The main thing for 2000 is the private sector."

The donors' partnership with ITF is important. The most recent donor conference was in October 1999, and they will continue as ITF's work progresses. "We are planning to have another one [donor conference] maybe in October or November of this year. That's when we show the donors where we are and what we are doing. There is another body [that is] very important, it's the so-called advisory board. We can also call it the board of donors, so all donors who want to, of course, can have their seats. I have another advisory board meeting in the end of

February when I will present the program for 2000 and the report for 1999."

Cimperšek has a vision for BiH, for Slovenia, and for the future of ITF. He hopes that the Trust will lead to others like it in landmined countries around the world.

"I think that establishing the ITF was quite good, maybe not in the start, they didn't believe that it was a good idea because of the regional approach. The regional approach is probably, not just in demining but also in other parts of business, better than world-wide. I can say in the end that we are very happy that we have such good donor countries in the Trust fund, [such as] the United States, Germany, Japan, Switzerland and Canada. They have helped us get more funds and they support our approach in the Balkans. I think that [the ITF] model could be used somewhere else, not that ITF would work somewhere else, but that approach with the country who can do something, who doesn't have [landmine] problems. Otherwise, you have the problem where you spend all your money in your country and then forget the others. I think that's the approach for the world and for the future." ■

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Mine victims receive treatment at the Slovenian Institute for Rehabilitation. The Center was activated in May 1998.

Photo c/o ITF

# Reducing the Threat of Landmines for Kosovo's Children

by Margaret S. Busé

UNICEF started mine-awareness activities in Kosovo February 1998. At that time the threat was perceived to be the result of the indiscriminate planting of landmines. The high rate of injuries among children and youth indicated UNICEF's need to target children and their parents. Children and youth are especially at risk because of their natural inquisitiveness and risk-taking behaviors.

Initially, mine awareness started in the camps and targeted the refugees, who were in preparation for their return home. Mine-awareness messages were

developed using posters and leaflets. Immediately after the signing of the peace treaty, the Transitional/Repatriation phase was initiated by UNMACC, specifying safety behavior. Local media were involved in disseminating this material, along with UNICEF trained teachers and community workers in mine-awareness education. Surveys showed that this initial campaign was successful with refugees well aware of mines and behavior altering steps so as not to become a landmine victim.

While there are some common elements in mine-affected communities throughout the world,



A young boy, his leg injured from a landmine, sits among the ruins.

Photo c/o ICRC



A child's drawing reveals a landmine problem.  
Photo c/o ICRC / David Higgs

effective campaigns are those that are adapted to local needs, culture and traditions. After conducting fieldwork and information about behaviors and victims, mine-awareness programs can be tailored for target groups. A monitoring and evaluation component is part of

all operations. UNICEF returns to schools and makes sure children have attended mine-awareness sessions, where needs-assessment surveys are conducted and external evaluations are all scheduled.

Enda Dowd, UNICEF mine awareness coordinator in Kosovo, feels that while it is early to identify successes, the Child to Child Program has proved popular with staff, education authorities and children. This unique project uses a child-to-child strategy. Children ages 10 through 14 are trained to disseminate information about the dangers of mines and UXO to their peer groups, younger children and their families. Games and other interactive approaches are used. Children are encouraged to create their own communication tools so that they can pass this information along easily to children and adults.

Another success that Dowd mentions is the easy start-up of UNMACC. "Unfortunately, one of the main challenges has been the number of agencies coming to Kosovo, and not going through UNMACC to identify where they are working. This makes coordination of efforts very difficult." The UNMACC produces a map indicating where organizations are working. Dowd also mentions the lack of accurate casualty data as being a concern. "Without a proper evaluation of the effectiveness of the mine-education campaign, the drop in casualty figures cannot be attributed to it." Assessments will be carried out in the spring.

"Predictions are that casualties will drop over the winter period and then increase in spring when there will be more movement, and farmers and villagers will be anxious to get back in their fields. An assessment after spring will be particularly important," said Dowd.

The World Health Organization is in the process of establishing a comprehensive data collection system for mine/UXO victims in Kosovo, which involves the ICRC, and local clinics and hospitals. UNICEF states those children below the age of 14 account for 30 percent of landmine injuries and young adults between 15-24 are another 41 percent of injuries.

Mine-awareness campaigns have been especially challenging. The educational system within Kosovo has been devastated, with many schools vandalized or destroyed and an undetermined number of teachers injured or killed. In addition, landmines laid during the conflict, cluster bombs, UXO and the possibility of booby traps left by fleeing combatants, create an especially dangerous environment for children. A number of schools were used by the military and have been littered with mines, UXO and booby traps, which hinder the repair and reconstruction process. In many cases children are not aware of the danger. One boy, looking for books to read at a school, was injured. A mine/UXO-assessment has been conducted and organizations have been tasked with clearance projects, but this is a lengthy process.

A rapid assessment by UNICEF in an area west and south of Pristina, showed that out of 13 schools inspected, five were demolished, four were burnt, and one was suspected of being booby trapped. Only three were deemed safe and usable. The children's agency will provide educational kits or school-in-a-box, which contain both classroom and student supplies. The kits will also help to mobilize teachers, including those whom UNICEF is working with in refugee camps.

The latest casualty figures from UNMACC for 1999 are:	
June—120	July—156
August—47	September—60
October—20	November—2

Currently, The Dodona National Puppet Theater is organizing a puppet show, which will incorporate mine/UXO awareness for children. They intend to start their puppet tour in areas of high mine awareness priority.

UNICEF has alerted people to the danger of landmines and will intensify mine awareness activities in Kosovo itself. The effort is focusing on providing mine/UXO-awareness educational materials in local languages to primary schools and communities. The development of resources to promote human and child rights and assist local reconciliation efforts through peace education will also be explored. The agency expressed hope that by restoring primary education, it will help Kosovo's children to have a tangible sense that normal life can and will go on.

Nobel Peace Prize winner Jody Williams and Canada's Ambassador for Mine Action, Jill E. Sinclair, visited Kosovo on June 30 to July 1, 1999, to highlight UNICEF's mine-awareness activities there and to appeal for an intensification of demining in the war-torn province. "The risk presented by mines and unexploded ordnance in Kosovo is extremely high," Williams said. "Children are particularly in danger and many have already suffered severe injury or death because they have inadvertently stepped on these lethal and illegal weapons of war."

UNICEF's integrated mine-awareness education campaign, involves:

- Training teachers, social workers and volunteers in landmine-awareness skills.
- Dissemination of mine-awareness posters.
- Use of mobile theatre groups, radio broadcasts and other means of public education.
- Distribution, at border crossing points and in their home communities, of information leaflets to returning refugees.

"Landmines everywhere are a scourge of innocents and of children in particular," said Williams. "I hope the trip to Kosovo will make it clear that an

urgent priority must be placed on demining, and that concrete steps must be taken quickly to protect innocent children, women and others in the still-volatile province," said Sinclair.

UNICEF has been appointed as the U.N. focal point for mine-awareness education. They have developed International Guidelines to promote effective planning, implementation, monitoring and evaluating of mine-awareness programs. UNICEF and its partners have distributed more than one million posters and leaflets in Kosovo. Dowd said, "The overall goal for the program is to change people's behavior and reduce the casualty rate. Specifically we want to continue to incorporate mine-awareness education into school curriculum using a consultative process with local education authorities." ■



Using a UNICEF poster illustrating different mine warning signs, a UNICEF instructor leads a mine awareness class for a group of Kosovar refugee children in the Sienkovec I Camp.

Photo c/o UNICEF / Jeremy Horner



# A Squad of Their Own



All-woman demining team ready to enter the mine field.  
Photo c/o NPA

by Margaret S. Busé

The first all-female demining team was deployed in Kosovo in late November 1999. Comprised of women refugees who had previously been housewives, they are the first all-female demining team in the world. In Kosovo's traditional patriarchal society, few women work outside the home and until now, no women worked in this internationally male dominated occupation. The sight of the women deminers, long hair peeking out of helmets, has raised a few eyebrows. As one elderly farmer remarked upon seeing them, "My poor dears, you are so beautiful."

The 68 women deminers were not making an

overt feminist statement by the occupation they had chosen. They were simply going to work. Many women have to assume the role of breadwinner because their husbands have been killed in the war. Thomas Jarnehed, Norwegian People's Aid demining program manager in Kosovo, said that he chose the female deminers because of their experience from the war. "When I set up the NPA demining program, I was determined to implement a policy of equality between the sexes. My objective is to have 50 percent males and females. It was a decision I took alone."

NPA is responsible for training and paying the deminers. Each woman attended a five-week training

course in Pec, Yugoslavia, where, through Scandinavian custom, they were able to bring their children. They receive a monthly salary of approximately \$423, which is considered good pay in a province where two-thirds of the workforce is unemployed. Women are currently out in the field, many commanding squads of their own. Demining has boosted the status and self-esteem of the women involved with this nerve-jarring occupation.

"You need a lot of patience with this work, where depending on the amount of vegetation, you may need all day to clear a six- to 16-foot lane," says Borge Hoknes, NPA's project manager. "In Scandinavia, we believe that it is important to show there are a lot more equalities than differences between men and women. Demining is one area where you can see that clearly." Equalities aside, Hoknes also mentioned that the patience and commitment of the women actually make them much better than men at clearing mines. He mentioned that women, in general, were better motivated, committed and displayed a more even temperament.

Initially, there were some tensions between male and the female deminers. A few men with unwavering opinions were removed from the demining teams. Sometimes, "men want to be rough and tough and this is no place for a Rambo," says Hoknes. "In this job you don't get a second chance. We look for individuals from stable backgrounds who are calm and patient and have a commitment to helping their people."

Though the women know the risks, most of them state they are not afraid. Nora Kelmendi, whose husband is also a deminer, says, "I'm not afraid. I'm

an optimistic person. I just have to be careful." She also adds that her husband is very proud of her, her bravery, and that she made the decisions to be a deminer on her own. A mother of two small children, Kelmendi says, "I heard of the children being killed by mines and I took the opportunity to do something. It is normal to be a bit scared, but we know if we fol-



The painstaking work of demining. A small area may be a day's work. The Serbs mined schools and playgrounds, and they booby-trapped toys lying on the ground.

Photo c/o NPA

low the rules there will be no problem. The men I meet congratulate me."

Valbona Berisha did not receive such emotional support. "When I told them at home what I am doing my brother shouted at me that I was sick and didn't know the meaning of the word danger. But my husband was killed by the Serbs. I am helping the people of Kosovo and most of all, I help the children."

"I thought I would do the training, then think it over again, but now it is in my blood," says Kelmendi. "People say to me, 'You're very cool, How come you are not afraid?' I don't have words to describe how good I feel about it. This is my contribution to Kosovo, to help clean up the mines."

The Serbs mined schools and playgrounds, and they booby-trapped toys lying on the ground. NPA has trained over 90 recruits for demining. Many experts in the field say that it will take years to clear the mines. Current priorities are homes, schools and agricultural land so those farmers may be able to till the ground in the spring. ■



A woman kneels in patience. Some men do not support women deminers.

Photo c/o NPA

## Women Deminers in Kosovo

### Contact Information

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# Road Trip with a MINECAT

by Stephanie Schlosser

In *The Journal of Mine Action* 3.2, we spotlighted the **Compact 230-Minecat**, a multi-role platform suitable for both military and humanitarian applications whose primary role is to be a mine-clearance vehicle. Since that article in the summer of 1999, the Minecat has had a proper education, going through a series of tests in various landscapes and in front of tough judges. Landmine clearing is serious business and

before a new piece of equipment can be put on the world market, it has to prove itself in rigorous settings. After all, the real customers in the demining market are those people whose lives and livelihoods depend upon the clearing of their land. J. Barry Middlemass, owner of the Lockwood Beck consulting company, brings us through a series of Minecat testing trips on this road trip from Norway to Kosovo.



The Minecat rests, its mouth gaping open, after having dug 0.5 m.

## Christening the Cat

A few thoughts on the past few months of the Minecat. Since the last entry in the magazine we have continued in the comprehensive testing of the machine. Test results are now filtering through with the answers to confirm our design and the way ahead.

- Report one (1) NoDeCo from FFI (Military Testing Establishment)
- Report two (2) NoDeCo from Military Engineers (Norway) Live Explosives (Draft only - released soon)
- Report three (3) From KOSOVO by NPA Live Mines November '99

Visitors have been many and various including the International Trust Fund (ITF). Their representative was given the opportunity to see our testing and sit in the vehicle as it was flailing. The experience gave him a much better understanding of the equipment. We hope that future customers will use the ITF for funding donations. Our company, NGOs and others should benefit from their unique arrangement with the United States. After comprehensive simulated tests were carried out by NPA, (in various soil conditions, gradients, fields, tracks, and scrub-including cold Norwegian wind and rain) they agreed that the machine would be taken to Kosovo, funded by NoDeCo but under the control of NPA. *Barry Middlemass, November 1&2, 1999*

## Detour à Mourmalon

En route to Kosovo we stopped off in France, at the military training area of Mourmalon. Here we carried out a presentation to members of the military, manufacturers and NGOs, and the Ambassador for Mines (France). The presentation was the worst the author has ever seen. This was entirely due to the time constraints and security of the equipment, as the vehicle was assembled directly from the two 20 ft. ISO containers and driven directly to the site, without tightening or tensioning attachments and testing the balance of the flail. After a brief description of a French "MURPHY" the machine still managed to dig to 15 cm under normal conditions and dug into the ground 50 cm after demolishing some fairly dense scrub. The second demonstration was for the Army Staff and Army Experimental Establishments only. Under the

control of the Military Engineer Staff they carried out four detonations:

1. 500 GMS HE (for effects on chains and deflector) **No Damage**
2. 3 kgms HE **No Damage**
3. 7 kgms Non metallic Anti-Tank Mine Flail **Disrupted the Mine - No Damage**
4. 7 kgms plus he charge (Command detonated- under the flail) **On detonation the chain above the explosion and the head of the chain each side of the explosion was lost. No further damage.**

Immediately after the demonstration the Minecat was reloaded into the containers, under the supervision and stopwatches of the Army Staff. The complete load was ready to move off to Kosovo within one hour. *Barry Middlemass, November 8 & 9, 1999*



Some scrub clearance and digging from the presentation in France.

## Where and What Next

Norwegian People's Aid (NPA) has given the approval for the purchase of the Minecat. Hopefully funding by the Norwegian government will allow them to purchase this badly needed equipment and fulfill a season's work in their areas in Kosovo. Another agency is pressing NoDeCo for the purchase of this particular machine and that is UNIPAK, a company who has carried out a lot of good clearance work around the city of Sarajevo and who has been sub-contracted to RONCO of the U.S. UNIPAK have been



Ready-to-Travel: The flail and some spares are in one container, ready to continue the Minecat's journey.

using NoDeCo's prototype Flail (UP-1) in their clearance of areas since last July '99, particularly against the powerful PROM-1, and have had great success to date. The company now has frozen the design of the COMPACT 30 MINECAT and will continue focusing on the versatility of various add-on equipment for the platform. A sub two- (2) meter Minecat is still in the frame for various customers with different "operational" requirements.

## Destination Mine Field

On arrival in Kosovo the machine had the back up of only one Operator/Mechanic, due to bereavement in the family of the second Op/Mech. I believe it must be made clear at this point that the back up personnel of NoDeCo are not ex-military and consequently, they cannot back up the "Operational" use of the machine. This point, I must stress, is something which at times is overlooked by the NGO or agency using the machine. The staff with the machine is there purely as advisers on the Mechanical and the Operating side of the equipment. Due to financial restrictions, "Technical/Operational" advisers cannot always be present during the early yet very important phases of the equipment's life. This situation puts a tremendous strain and responsibility on the "civilian" mechanic/operator, who only wants the best for the machine. I make this comment because, with the other member of staff missing, it was not possible to rebalance and check out the machine after its trip to France. A consequence of this was that the NGO wanted to start testing immediately after the machine arrived, mainly due to the deterioration of the weather and the need to have the men working with the equipment who had previously been allocated. The first test was carried out before the arrival of our Chief Technician (Mech), who on arrival carried out the re-balancing and checked out the remainder of checks on the machine. Finally, being satisfied that the Minecat was working to near maximum efficiency, the second series of tests were carried out with complete results as follows:

### LIVE MINE RESULTS

- Total mines and type deployed:
- Nine (9) Anti-Personnel (PMA-2/PMA-3)
  - Two (2) Blast/Fragmentation (PMR-2a/PMR-3a) including trip wire
  - Five (5) Anti-Tank (TMM-1/TMA-5/a)

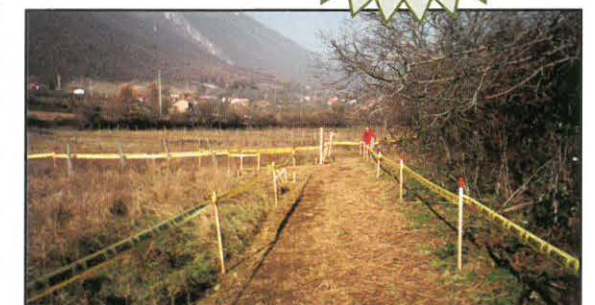
- All mines were cleared as follows:
- Detonated One (1) Anti-Tank (Loss of three (3) chain/heads)
  - Detonated Three (3) Anti-Personnel
  - Detonated One (1) Trip-wire Blast/Frag
  - Disrupted All other devices (Broken)

The area of ground used for these series of tests was compacted by the previous use of many heavy tracked and wheeled vehicles, making the test extremely hard for the penetration of the heads of the flail. The difficult ground will no doubt mean the use of an alternative chain head, if the customer requires a "digging" factor as well as the neutralization/clearance of devices. *Barry Middlemass, November 15, 1999*



The Minecat in Action: With the flail going strong, the Minecat clears mines through the snow in Kosovo.

The Mine Action Group (MAG) has recently purchased the Mine Cat for use in Kosovo. Work with the machine will commence in two months.



An operator examines a path cleared by the Minecat in Kosovo.

### Contact Information

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All photos c/o Barry Middlemass

# Chechnya



*"By day a Chechen  
may seem a peaceful  
citizen, but at night he  
is a WOLF."  
—Russian Major*

# the Republic of the Wolf

by Margaret S. Busé

In a state of humanitarian crisis, Chechnya, the poorest of states within the Russian Federation, continues to strive for independence. The pre-war arsenal of landmines consisted primarily of PMN and OMZ mines. Stocks of PM's were moved to secret bases in the mountain regions during the war. There is also a considerable black market for land-

mines. dependence. The number of civilian dead as a result was estimated between 40,000-100,000. At the start of the war, mines were still being cleared from WWII. HALO Trust said it had seen new mine fields laid even after the previous peace agreement had been signed in 1996. The intensity of Russian bombardment of Chechnya is said to have exceeded Stalingrad. Serbian bombardment of Sarajevo reached 3,500 per day, Grozny experienced 4,000 shells per hour. The Russian Federation blanketed Chechnya with 1,200,000 landmines during the 1994-1996 war and estimates of the cost of damage may be as high as \$150 million. Despite Chechnya's high landmine count, Chechnya still remains unlisted on the UN landmine list. Even though a peace agreement was signed on August 4, 1995, bloodshed has again found this country escalating the landmine crisis as landmines are laid indiscriminately and as the front line shifts.

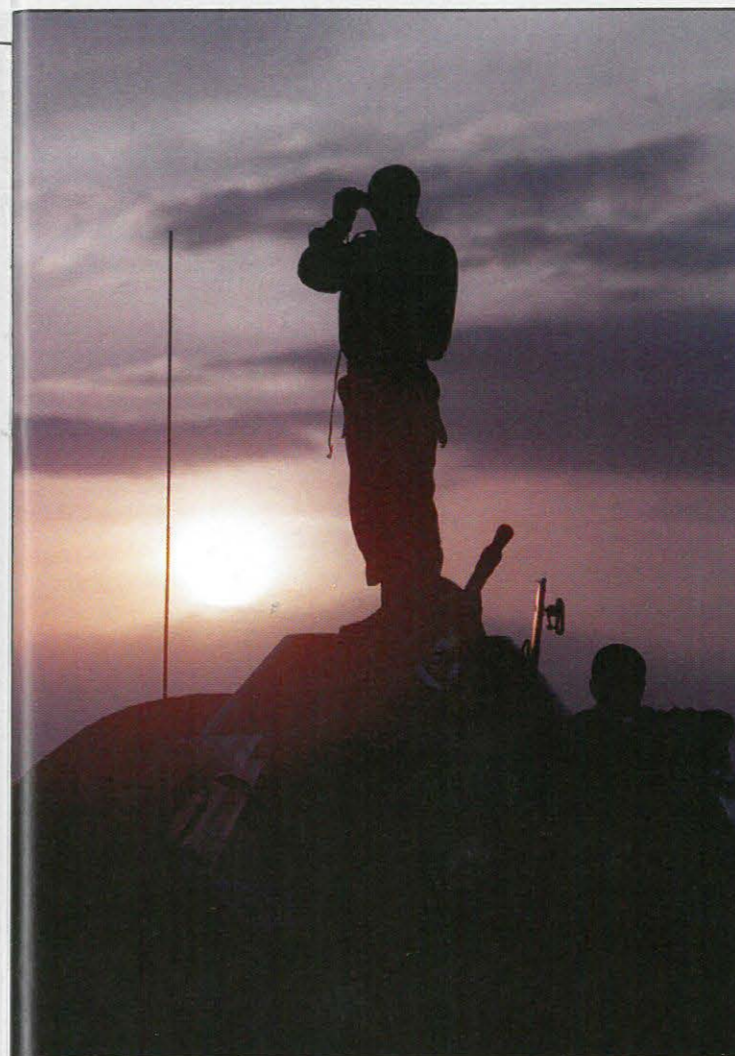
During the previous war, as control shifted from one side to the other, territories were repeatedly mined and re-mined. Landmines may affect as much as 80 percent of Chechnya. Because of the current fighting and because no mine field maps have been made available, a comprehensive survey is nearly impossible. Before the current war, there were 600,000 people in Chechnya living beside over 1.2 million landmines. HALO Trust estimates that 20,000 hectares of farmland cannot be used because of the presence of land-

mines. The Russian army and the Chechen rebels have used mines in the previous and current war, laying mines around their bases, checkpoints, militarily significant towns and roadways. Mines have continued to be used as booby traps in houses and schoolyards, and littered around corpses. AP mines, while used by the military on both sides, are also used by various armed groups and robbers in attacks against political figures.

From 1994 to 1996, the Russian Federation waged war against the people of Chechnya in an attempt to halt the country's growing in-



Downtown Grozny.  
Photo c/o Associated Press /  
Mindaugas Kublis



A Russian soldier views a territory in Chechnya from atop an APC.  
Photo c/o Associated Press / Maxim Marmur

mines. This has severe consequences for communities that must rely on farming for sustainability.

In the first three months of fighting, from October-December 1999, a force of up to 100,000 Russian troops had taken almost total control of Chechnya's lowland valleys and steppes. The remaining areas had been held by the guerrillas. Parts of Grozny itself and the steep gorges in the mountains to the south, are much more difficult military targets for a conventional army. Despite heavy fighting in early January, neither side appeared to make significant gains in the south of the city. Both forces occupied high points on the outskirts of the city for a considerable time. There was constant fire from mortars, cannon and light arms. At night, tracer fire lit up the sky. It was impossible to know how many residents were still trapped in the city, but there were clearly thousands, perhaps tens of thousands, living in dark cellars with little food. "The city has been heavily mined by the Islamic guerrillas Russia invaded Chechnya to uproot," General Kazantsev said. If his

troops tried to storm the city, large numbers of people would certainly be killed and wounded.

Russia's military Commander, General Viktor Kazantsev felt his forces have been too "tender hearted" in Chechnya. The Russian army then formulated new policies in an attempt to gain a better foothold with the rebels. Use of fuel air explosives, pressure on the Moscow media not to give "air time to terrorists," and the alarming new policy to round up all Chechen males between the ages of 10 and 60 are some of the Russian army's tactics to bring about resolution. Many of the Chechen males are expected to be sent to filtration camps (prison camps). Human Rights Watch has reported unspeakable acts of torture on the men and women held in these camps.

Russian history is full of precedent for this type of military action. The Czars and Stalin had also attempted ethnic cleansing of the Muslims because the Muslims had wanted independence from Russia. The attempt to prevent Chechnya's independence by Russia may only result in a long, bloody and continuous war. Sergei Koualyev, a deputy of the Russian State of Duma, predicts the Chechen war is likely to turn into an Afghan-type guerilla war that will last for years. The Chechens may continue to fight

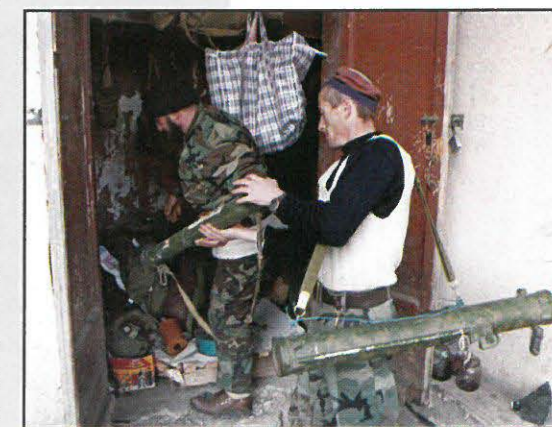
slowly, patiently and without rest until they have their freedom.

Western nations had encouraged a cease-fire, but Russia has refused, stating that a cease-fire would only allow the rebels to regroup. Secretary of State Madeleine Albright encourages Russia to seek a political solution to Chechen independence. France and Britain have hinted at the possibility of sanctions on Russia. "One cannot take a civilian population hostage, threaten to treat an entire population as terrorists, and ask us (European nations) to show understanding," said spokeswoman Catherine Colonna. The International Monetary Fund announced that the release of funds to Russia had been delayed until Russia implements legal and administrative changes though some sources deny that

*"Why did you stay here:  
If you decided to stay  
here that means you are  
guerillas. This is not  
1995. This time we came  
here with the order to  
sweep away everything  
that grows and moves.  
Your city is not subject to  
restoration, we shall  
level it to the ground and  
you together with it."  
—Russian soldier to a  
Chechen basement*

Two Chechens prepare grenade  
launchers.

Photo c/o Associated Press / Ruslan  
Masayev



the delay is related to the current situation in Chechnya.

Mine action funding, mine clearance and mine awareness are completely non-existent in the current state of crisis in Chechnya. The few NGOs that have operated there can only spend limited time in the area. The ICRC withdrew after the assassination of six workers in 1996. MERLIN, (Medical Emergency Relief International) did distribute mine awareness posters from 1996-1998, but withdrew later that same year.

HALO Trust withdrew in December 1999. HALO trust may have been one of the last NGO's operating in Chechnya. When the fighting got too severe for mine clearance work, HALO switched its efforts to moving medical supplies between hospitals and maintaining generators for the civilians. Recently, when the Russians bombarded a mine field that HALO had been clearing, three of HALO's staff were killed. "There are no distinctions between civilian and military targets. If it moves they strike it with aircraft, and if it does not move they shell it," says

Landmine casualties and victim assistance data is not reliable. Estimates from the previous war site 800 casualties in 1996, half of which were children. 10 percent of children suffer from acute posttraumatic stress disorders as a result of landmine accidents. Victim assistance was nearly impossible prior to the current fighting. The health care system in Chechnya was inadequate before the war because of severe shortages of equipment, medicine and water. If medical care is available, the victim must pay for any prosthesis and crutches.

Social and economic problems were and will continue to be staggering. Lack of financial support from other countries, information blockades and the absence of humanitarian relief are all devastating to this tiny mountain country. Only a peace settlement and mutual cooperation will allow humanitarian organizations to safely begin the seemingly insurmountable task of rebuilding the lives of the Chechen people.

Currently, the situation for the Russian Rebels is dire. While multiple rocket launchers are still being fired at Grozny, the brunt of the fighting has now moved to the highlands, the last rebel strong hold. Russian forces have launched an intensive military attack in Alkhan-Kala village where they have been many rebel casualties to include prominent rebel commanders.

Western military forces have asserted that the attack on Alkhan-Kala was an ambush. The Chechens were lured there. The fighters were deliberately given a "corridor" to escape Grozny. This "corridor" was actually a mine field and several hundred rebel fighters were killed when they entered it. The few dozen who successfully crossed and reached Alkhan-Kala found the Russians waiting for them.

At the beginning of the new millenium, Russia is once again faced with defining its future, as it did in the early 20th century. Former president Yeltsin, chagrined by the comments of leaders in the European Union and the United States over the aggressive assault on Chechnya, has made the comment, "They must have forgotten for a moment what Russia is. It has a full arsenal of nuclear weapons." This may be so, but there is also a rampant black market operating, severe food shortages, and republics in their federation breaking away from the motherland. While none will dispute the need for a country to remain strong, unified and prosperous, these are not the conditions of the current Russian Federation. ■

HALO director Guy Willoughby. Many feel that HALO was doing instrumental work in Chechnya, clearing mines and aiding in humanitarian relief efforts.

The Chechen civilians are caught in the middle of the fighting. Many want to leave through the "safe" corridors the Russians have provided. They can't trust the roadways. There are numerous stories of the Russian soldiers demanding bribes and looting belongings at checkpoints. "To the north are Russian guns, to the south villages are being hit. They are afraid of becoming targets on both sides of this war," says Willoughby.



Amid the rumble of distant explosions from Russian forces, thousands of Chechens rallied in the streets of Grozny, condemning the Russian offensive, Oct. 14, 1999.

Photo c/o Associated Press / Ruslan Masayev

# The Munitions Challenge in Albania

by Steve Brown

## Ammunition Storage and Disposal Implementation Team

The latter function was undertaken in late 1998 by an eight-man military Ammunition Storage and Disposal Implementation Team (ASDIT) with members from the UK, United States, Denmark, Belgium and Italy. They carried out the training of Conventional Munitions Disposal (CMD) of 16 Albanian officers, the planning and conduct of UXO clearance tasks, EOD clearance planning, provision of ammunition storage and management training for 14 officers. They also began training for the initial Ammunition Storage Area (ASA) safety, operational assessments, improved chemical analysis training and gave advice to Albanian laboratory personnel.

## EOD and Ammunition Storage Training Team (EOD and ASTT)

The mission was successful, which provided the AAF with the basic skills necessary to conduct operational tasks confidently. This mission also concluded that further assistance was necessary to assist in the establishment of a full concept of operations, signal NATO's commitment to capacity building and to maintain momentum in resolving the problem. The NATO Political Military Steering Committee (PMSC) authorized the deployment of a second mission, the EOD and Ammunition Storage Training Team (EODASTT) in early 1999.

The mission was unique in many ways because a decision was taken to contract out the technical nucleus of the team to a commercial company by way of competitive tender. Mine Clear International, a UK-based company specializing in EOD operations, was selected and provided a team of two British and one Canadian, former military Ammunition Technical Officers (ATO). The team was completed by serving military staff from Italy, the United States and Denmark. Initially envisaged as a three-month mission, its success and immediate impact persuaded the

Political controversy, economic chaos and increasing criminality have faced Albania since its democratic revolution in late 1990. Anti-government demonstrations erupted into violence, which took the form of attacks against state facilities including public offices, schools, factories and military depots. Of particular concern were the attacks against ammunition and weapons storage areas. Over 600,000 weapons and several thousand tons of ammunition and explosives were looted and some 16 ammunition storage areas, known as Hot Spots, were set ablaze resulting in massive unexploded ordnance contamination of the sites and surrounding areas.

## NATO Explosive Ordnance Disposal and Storage Support

As part of its commitment to democratic reform, the government of Albania joined the North Atlantic Cooperation Council (NACC) in 1992 and was one of the first countries to join the Partnership for Peace (PfP) program with the ultimate goal of NATO membership. NACC sponsored expert teams that undertook intensive assessment missions to Albania in 1997 and 1998 concentrating on the following issues:

- National Security concept and democratic control of the Albanian Armed Forces (AAF).
- Reorganization and functioning of the Ministry of Defense, general staff, and structure of the AAF.
- Development of a Command, Control, and Communications Information (C<sup>2</sup>I) system.
- Assessments of the standards of basic military infrastructure as well as defense planning and budgeting.
- Storage and handling of ammunition, Explosive Ordnance Disposal (EOD) and security of military depots.



AT mines and UXO stored in a farmer's tin shed.  
Photo c/o HALO Trust

PMSC to extend the mission incrementally until June 2000.

### EODASTT Mission

Assembled from Jan. 12 to Feb. 1, 1999, the second NATO mission's primary objective was "To provide expert EOD and Ammunition Storage planning, assistance, training and advice to the Albanian Ministry of Defense in order that the AAF can plan and safely conduct EOD operations at Unexploded Ordnance (UXO) contaminated sites, Logistic Ammunition Disposal operations and the rationalization and establishment of safe ammunition storage."

The mission goals for Explosive Ordnance Disposal was to assist the Ministry of Defense in forming an EOD organization, help in the production of all procedures for the organization, assist in the planning of Hot Spot clearance, validating ammunition disposal training, and procedures compliance are also a priority. Preparation of a storage plan in conjunction with the Ministry of Defense was essential for ammunition management as well as advising on the establishment of Ammunition Storage Areas (ASA) to reflect NATO standards and norms. Assisting in identification, establishment, validation of Logistic Disposal Operations (LDO), advice of demolition grounds for LDO, and providing technical support to a UK-funded demilitarization feasibility study was critical to success.

### Explosive Ordnance Disposal

This element of the mission, which is considered to be the most important by the Albanians, pro-

gressed smoothly. As of Dec. 15, 1999, many goals had been met such as, the establishment of the AAF EOD organization management team, the provision of sufficient EOD equipment donated by NATO member-countries to equip current EOD teams, the introduction of donated EOD equipment into service and training in use and deployment. All of these goals were achieved as well as several more that followed. More influential ones were the reconnaissance of all 16 Hot Spots as well as the operation orders and associated planning documentation was prepared for each individual Hot Spot. The Hot Spot at Palikesht was totally cleared of UXO and clearance of a second Hot Spot at Mbrestan was commenced. All the low-level individual and collective training was completed and the commencement of CMD instructors training began for all AAF personnel.

The program was disrupted by the Kosovo crisis as AAF EOD resources, supported by EODASTT technical input, were re-tasked to deal with the Serbian cross-border KB-1 sub-munitions, conventional artillery and mortar strikes in border areas. Other areas that needed attention were the stray NATO air-delivered weapons, the surveying and marking of mined areas in Albania, and the clearing of supply routes and emergency mine clearance and casualty recovery tasks from mined areas.

### Ammunition Management

This very complex area can only be successfully achieved by a long-term program of assistance designed to develop a full technical ammunition management system. There will be a need to develop an external quantity distance protection system in conjunction with national, regional and local authorities. This will help develop health and safety practices within ASA to NATO standards as well as accident reporting, ammunition bans, technical data and ammunition historical records. There is a need to design new depots, control licensing and waivers on existing sites and develop a system to deal with conception, procurement, in service life and final disposal of ammunition natures. A tracking system that handles and earmarks war reserves, training issues and has overall visibility of the stockpile is also a necessity.

A full set of ammunition technical regulations would be an added benefit. The clear prerequisite to future storage planning was an ammunition program based on AAF future operational and training requirements. A spreadsheet-based scaling document was produced utilizing the NATO norm of 30 days gen-

eral war for operations and individual training requirements. This document was carefully reviewed in conjunction with the Albanian General Staff to ensure that they understood the concept, the spreadsheet interaction and methodology, and that base information on the types of ammunition and weapon types could be validated. As of Dec. 15, 1999, they had achieved full site surveys at 10 ASAs and completed full reporting on the findings, conclusions and recommendations and then passed on to AAF. A PC-based ammunition management system was developed and submitted in draft form to the AAF and eventually accepted. Finally, a development plan for a model ASA at Borizane was commenced.

### Logistic and Explosive Ordnance Disposal

It has been agreed that this area can be realistically addressed only as a two-stage operation with stage one comprising logistics disposal by demolition and burning of that element of the stockpile which is identified or suspected of being dangerous by the AAF. Stage two would detail the fabrication of a permanent demilitarization facility in Albania. Just nine percent of the Albanian ammunition stockpile is less than 30-years-old. It was determined that as much as 90 percent of the stockpile will require disposal within the next 10 years, which is clearly a major challenge for the AAF. The key ammunition requiring logistical disposal is unopened ammunition in poor condition (800+ tons) as well as stock declared unserviceable by the AAF weighing up to as much as 3,000 tons. Another factor needed to be disposed of are the AP and AT mines as part of the Ottawa Treaty obligation (5,000 tons). Although progress in the explosive ordnance area is vital, real time activity has been exceptional. There is clearly a need for further support in the continued validation of EOD activity, in particular Hot Spot Clearance Procedures. The team is aware that some information has been lost in the translation and interpretation process. The training for further EOD operators will enable the Albanians to enhance current disposal operations, address the ongoing requirement to train EOD operators and to develop and implement a process to identify, select and train Albanian personnel as EOD trainers.

### Future Task Areas

Others areas of EOD and ammunition management that require support are cataloging a system which would be a NATO standard system for all ammunition needs, but Albania does not currently

possess a credible counter-IEDD capability. An extension to the capability of the AAF EOD organization would be considered a logical enhancement. The ammunition stockpile requires a 100 percent surveillance program to ascertain serviceability. The AAF will require further training in this function. A number of bad handling and storage practices which are intrinsically unsafe have been identified and an initial course held in December 1999 will be supplemented by a depot-by-depot program of active risk limitation measures.

### Conclusions

Both the EODASTT and UNDP Weapons Collections missions have proved extremely successful on a number of levels. In Albania they are seen as both a practical and symbolic indicator that the country is stabilizing and addressing fundamental security and safety issues. NATO has seen a vindication of its concept of the Individual Partnership Program within PFP believing success in such a technically complex area bodes well for addressing other specialist areas with confidence. NATO has also seen its first steps towards contracting military advisory tasks to prove successful with the hope that such future tasks will not be forced to rely on the allocation of scarce military personnel resources from member nations. The UNDP approach has vindicated the view that the collective responsibility and ownership engendered through this weapons collection program is the way forward, and hopes to replicate the approach in Albania and elsewhere. ■

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Map c/o www.albanian.com

# UNMIK Mine Action Coordination Center



Albania: Bread distribution for Kosovar refugees.  
Photo c/o ICRC / Ursula Meissner

by Christine Brawdy

In October 1999 when Kosovo Forces (KFOR) entered the Province of Pristina, they were immediately confronted with the problems encountered by a population returning through areas contaminated by unexploded, NATO-dropped, cluster munitions (CBU). NATO advised that as many as 333 areas had been bombarded with such aerial delivered weapons. They found the problem extended to more than 600 mine fields left by the Serbian Army (VJ), Police (MUP), and other paramilitary forces. These were principally along the border with Albania and the Federal Yugoslav Republic of Macedonia (FYROM) and scattered in other strategic areas on the interior.

The resulting damages in terms of property and human casualties alerted the international community to the potential for even more widespread devastation in the months to come, as Kosovo began restructuring. Acting quickly, the United Nations passed resolution #1244, which established the U.N. Mission in Kosovo (UNMIK). The first order of business by UNMIK included setting up the Mine Action Coordination Center (MACC). Such a rapid response, in attempt to coordinate the activities of international and local agencies, set the stage for establishing a best-case scenario for mine action worldwide.

UNMIK established an Outline Concept Plan, which defines a three-stage program for Mine Action. The Preliminary, Emergency, and Consolidation phases are designed as a systematic, comprehensive response to the problem. During the Preliminary Phase, the Mine Action Coordination Center, operating under UNMAS auspices, was asked to coordinate and control all operational assets mobilized through rapid donor intervention, and to address the immediate humanitarian crisis associated with the spontaneous return of thousands of refugees. As this initial phase drew to a close and the MACC moved into the current Emergency Phase, the scope of their mandate expanded to include the coordination of all mine action in Kosovo.

Following this mandate, MACC's team, headed by Program Manager Mr. John Flanagan, has worked in conjunction with organizations like UNICEF, the World Health Organization (WHO), the International Committee of the Red Cross (ICRC), and other NGOs, undertaking a multi-pronged and multi-disciplinary approach to mine action. This approach includes mine awareness, exten-

sive use of surveys, management of mine field data, clearance, local training to increase prospects for sustainability, and victim assistance.

The MACC is now effective in the operational coordination and tasking of 17 accredited mine clearance organizations, both NGO's and commercial companies, working on goals defined in the Operational Plan. Put simply, these are to get refugees back into their homes or onto their land, and to support the reconstruction of the necessary supporting infrastructure and rehabilitation of essential services. Priority clearance areas were identified using the following factors:

- proximity to (within 500 meters) villages or population centers.
- the number of mine incidents.
- accessibility.
- agricultural land and areas used for firewood collection.
- areas that impede the rehabilitation and reconstruction of essential services and utilities or other development projects.

As the coordinating body, MACC has no operational mine action assets. Instead, it draws on the assets and expertise of its partners who direct and implement local level activities on a daily basis, coordinating with KFOR personnel on operational matters. Through these "Senior Partners," the MACC has been able to extend their reach throughout the Province without needing to establish regional offices. Each Mine Clearance organization has been allocated particular municipalities in which to operate. Capabilities have been taken into consideration to ensure that there is an appropriate response available in each of the 29 municipalities.

At present, approximately 330 areas of Kosovo have been identified as being high priority. These priorities are regularly reviewed and amended as necessary, taking into consideration issues such as the seasonal use of land. Furthermore, the ongoing consultation and liaison with other agencies within Kosovo ensures that the requirements of all humanitarian and developmental organizations are taken into consideration. The MACC recognizes that coordination in these matters is especially critical to ensure rapid follow-on activities in cleared areas.

Due, in part, to its successful partnering with these organizations, MACC has realized a lengthy list of accomplishments. In just the four month period following its inception, the MACC has:

- created a framework for coordinating and planning mine action at the Provincial level.

- refined the planning process using the results of a province-wide survey of dangerous areas, conducted by HALO Trust.
- gathered survey information at the community level to assist in the identification of mine action priorities.
- established working relationships with mine clearance and mine awareness organizations which act as "Senior Partners" representing the MACC regionally.
- accredited mine action companies and NGOs in accordance with the U.N. International Standard for Humanitarian Mine Clearance Operations and the International Guidelines for Landmine and Unexploded Ordnance Awareness Education.
- assigned geographic coverage to all mine clearance organizations based on their capabilities and capacities.
- recorded Mine Clearance Achievements within the Province.
- recorded Provincial Mine Incidence figures.

MACC will continue to fulfill its current mandate and achieve its goals in mine clearance. In tandem with this work, MACC has identified priorities in the areas of mine awareness and victim assistance. These include providing a stop-gap measure for mine awareness prior to the formal integration of such pro-

RECEIVED	
Belgium: 264,434	Luxembourg: 126,186
Canada: 47,500	Norway: 199,980
Denmark: 211,996	Switzerland: 152,129
European Union: 2,525,520	United Kingdom: 300,000
France: 325,203	Miscellaneous: 339,000
PLEDGED	
Australia: 250,000	
Canada: 160,000	
Spain: 105,000	
European Union: 1,680,000	

grams into the school curriculum in November 2000 and introducing a basic psycho-social and advocacy support network to support the reintegration of victims in the workforce or school system. MACC's work has been generously supported by donor countries.

In addition, the MACC has received in-kind (personnel and equipment) offers and assistance from the governments of Belgium, Canada, Finland, France, Germany, New Zealand, Slovenia, Sweden, Switzerland and the United Kingdom. ■

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# notes FROM the FIELD

## BOSNIA

by Sinisa Malesevic, United Nations Association of the United States



A school destroyed by the bombardments.  
Photo c/o ICRC/Boris Heger

**The biggest problem is with children. "They need a place to play, and they play everywhere," says Vljako. "Thank goodness for the mine-awareness programs, which reinforce the lectures parents give at home."**

One day not long ago, just as the sun was setting on the city of Dobo, Serb Republic, Jovic Mirko stepped on a Yugoslav-made PMA-2 anti-personnel mine and lost a foot. Some call him "lucky," it was only a foot, and he will sometimes agree. His misery would have been so much greater if the victim had been one of his two children. The potential for greater misery is ever present in the Mirko household. For one thing, the mine field is somewhere in their garden, right behind the house that the family moved into two years ago. On that fateful evening, Mirko, whose job pays next to nothing and who was preparing the garden for planting vegetables, had decided to cut down some bushes to make room for a bigger crop. The mine was waiting for him.

Other mines lay in wait in other gardens, between houses and in the back alleys and front yards of Dobo. When the city's Muslim and Serb population began fighting in the early 1990s, the front lines were streets and neighbors. Both sides found landmines the cheapest way to hold the line and simply spread them about, usually keeping no record. After a while, people forget about the danger. "It is just a matter of time before we stop thinking," says Vljako Peric, a Dobo local. "You cannot be 100 percent alert all the time. Then we take shortcuts between streets and houses or decide to clear the trash from the front yard, wondering why we didn't do it a long time ago."

"The schools usually organize mine awareness programs, so the kids sit and listen. Of course the question remains are they going to take a new shortcut on their way home from school?" Peric asks. International agencies are making a big effort to improve the mine situation in Bosnia and Herzegovina, but demining takes time even when the mine fields are known and this is a country where there are huge numbers of mines whose whereabouts are unknown. In 1996, the United Nations established a mine action center to coordinate demining efforts and in 1998, that responsibility passed to the Bosnia and Herzegovina Demining Commission, which maintains the national mine database.

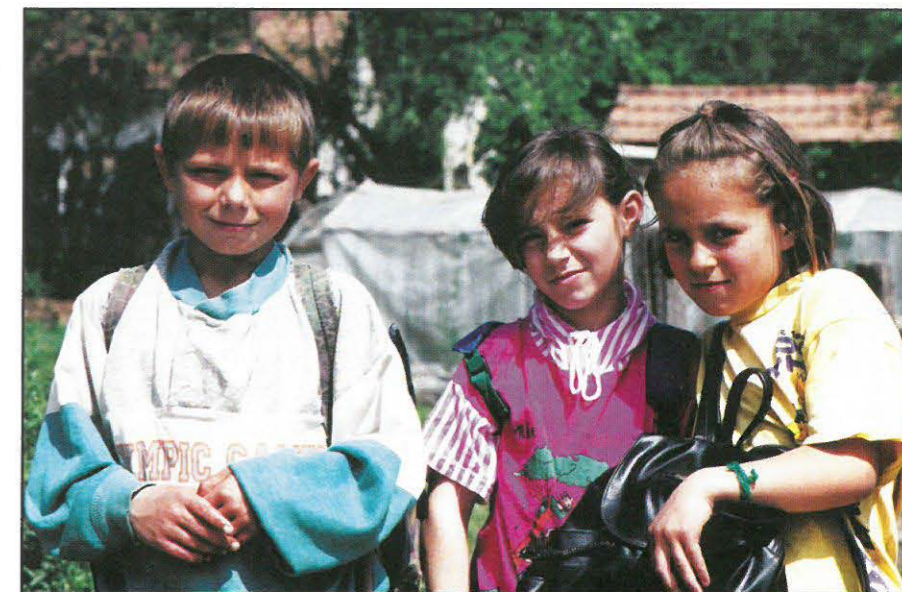
**It wasn't firewood but a cow that Ilija Javorac's neighbor Draginja Pertovic had gone to fetch when she was hurt by a mine three years ago. The cow had grazed in the same nearby meadow every day for weeks on end, but when Pertovic attempted to lead her back to the stable on this particular occasion, the animal pulled a trip wire and activated a mine that nearly took Pertovic's life. "I remember being very scared," she says of the days in the hospital in which she lay close to death. "I was not aware of what had happened and stupid thoughts ran through my mind. like 'What happened to the cow?' Unbelievable! At the moment, though, it seemed like the most natural question in the world."**

With regard to landmines in Dobo, one thing is certain. The end of the problem is nowhere in sight. This has not prevented people from returning to the city, however, whether in search of a house to live in or to recapture a memory of home. Many people would also like to return to Skipovac, a farming community 20 miles from Dobo, but there are few homes to claim and, more importantly, no fields to plow safely. Without land for growing corn and vegetables, there is no income and no food. Then there is the matter of school for the children. The schoolhouse itself may be safe, but the surrounding area and even the playgrounds

ited the village and promised that help would arrive but says, "sometimes I am scared that it will come too late." "In a way," he says, "it is like prison. You have no freedom of movement, no options. You can plow a field or two, but if you need more land, you can't have it because it may not be safe. If you need more income, you can cut wood, but you could get killed doing it. If you want to repair the school, you're welcome to take on the job, but you could die in the yard." If nothing changes, the handful of other families with school-age children will decide to leave Skipovac, and eventually, Zoric admits, he will also. All that would remain are a few elderly people and bad memories. Under such conditions, who would want to return?

### Luka Brcko

Not many years ago, the town of Luka Brcko was as essential to the life of the region as the heart is to the body. Today, this Sava river port is essentially lifeless. Useless. A town of ghosts. The Sava separates Bosnia and Herzegovina from the Republic of Croatia, and during the fighting that erupted in 1991,



Children from a mine affected community.  
Photo c/o UNA/USA

are mined. Skipovac's front lines changed so often, in fact, that is difficult to define any safe areas with certainty.

"We have no choice but to live here," says Nedeljko Zoric, who was born in the village and never left. "So my children have to walk to school in Sjenina Riojeka every day, 30 minutes each way. They go through mined areas to get there, and frankly I'm terrified. My children are aware of mines and can recognize every single type. I taught them everything I know, but what happens when they're with other children who don't realize the danger? I'm always worried when they go in a group, which is every day. If one of the kids in the group activates a PROM-1 mine, for example, that's a bounding fragmentation mine, well, it would kill or injure everyone standing around him. All it takes to activate it is pulling the tripwire, which looks like any other wire."

Zoric points out that various agencies have vis-

combatants on both sides of the river saw anti-personnel mines as an easy way to protect themselves from "the enemy." It did not help the clean-up that the city's status was left unresolved in the General Framework Agreement for Peace in Bosnia and Herzegovina of 1995. Brcko was recently designated a "self-standing district" of Bosnia and Herzegovina, but little else has changed.

Ask former port worker Sreten Simic about Brcko's problems, and he says that they are probably

# BOSNIA

no worse than in other areas, just different. The long and short of it, though, is that no one feels safe, and they have little to look forward to. Brcko's residents and would-be returnees dream about the past. What steps must be taken before the city can contemplate a future? "For one thing, demining both sides of the Sava, from west to east," says Simic. "After all, what's the use of clearing down river if mines remain upriver? Sadly, nobody says anything about this project."

One type of anti-personnel mine used freely by combatants in the Sava region, the PMA-3, a pres-



*Liberty Bridge, destroyed by the bombardments.*

Photo c/o ICRC/Boris Heger

sure operated blast mine, will give deminers particular trouble. Constructed entirely of plastic, it eludes a metal detector and cannot be safely neutralized. Bounding mines, like the PROM-1, were also popular. Occasionally, the sound of an ambulance breaks the stillness of Luka Brcko. Someone foolish enough to try fishing in the river, Simic speculates, or a curious child investigating the unknown. "I think of my own children," he says. "I was not as frightened during the war itself." Lately, reports Simic, he has thought a lot about leaving. "But where to go? It's no better anywhere else."

## The Zvornik-Srebrenica Power Line

Zvornik, a middle-sized town in the eastern part of the Serb Republic is located on the Drina River, which forms the republic's border with the Federal Republic of Yugoslavia. A bridge links the neighbors. In fact, it is not only the bridge that links them. The main power supply for the eastern part of the Serb Republic and for adjacent areas of Yugoslavia originates in a hydroelectric power plant down river at Višegrad; a thermoelectric plant at Ugljevik is another important source of power.

During the war the Višegrad plant sustained extensive damage, and so did the system of power lines between Zvornik and Srebrenica, about 30 miles south of Zvornik, through which the electricity feeds into homes, factories and public works. The Federal Republic of Yugoslavia supplied some resources for reconstructing Višegrad after the war, since Serb Republic wasn't up to the job itself, but the system of power lines will not last for long without maintenance and some major repairs. Demining, an expensive proposition, is a precondition for the entire undertaking. "We were very happy when they finally started to work [on the repairs]," said Ilija Javorac, who lives in a half-reconstructed house with no electricity in the nearby village of Drmna. "The municipal authorities promised us that electricity will come to our village, but nothing actually was going on. Then one day they came and started working on one of the [utility] poles in the hills. It looked promising, but we were afraid because we knew that it is the area where fighting took place. And then it happened. They hit a mine and one man, Dragan Stankovic, got killed ... I felt guilty, my mouth was dry and strong pain was eating my stomach."

Demining in Serb Republic requires international funding. A few local agencies, managed by local staff, receive support from international demining programs but must vie for funds with other countries in need. It has been the government's plan to establish its own demining capacity, but its moves in this direction have not been successful as of yet. In the absence of progress on demining and repairing the power lines, Javorac and his family have had to make a difficult decision. Should they live in their own house without electricity or take over someone else's

house where there is electricity but also the constant fear of being ejected by the owners, who could return any day.

Javorac notes that the lack of electricity also translates into a lack of running water. Since there is no local water system, the water for each house must be pumped from the family well. No electricity, no pump, Javorac points out. "Now we have to pull [the water] out manually from the well, like our parents did when they were young." Area residents used to make jokes about it, he reports, "Just like the good old days!" Javorac goes on to say that, as he and his neighbors spend more and more time without modern, electric powered appliances for cooking, washing and ironing, they have the feeling of "traveling backwards in time and of being unable to do anything about it."

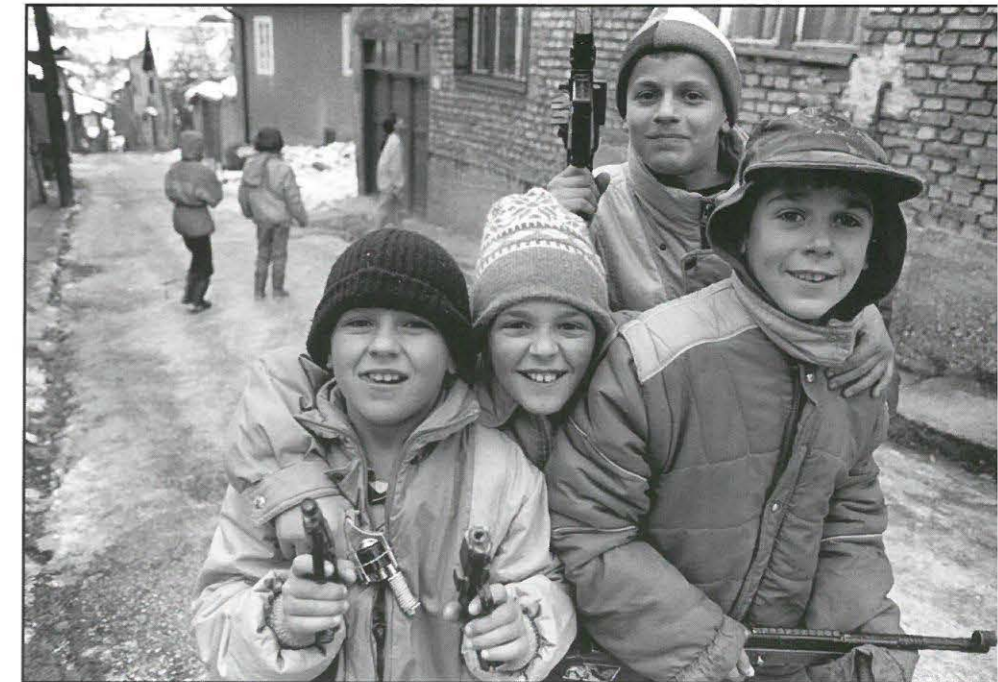
Javorac realizes the immensity of the task ahead. "It is not only a matter of a few minor repairs," he says, "but actually a whole system of utility poles and wiring. And that costs a lot, not to mention the demining that will have to take place before anything else." Obviously, he says, "we understand that it will not happen overnight, but we would be very grateful if we knew that it will ever happen."

During the war, military leaders of both sides found it easier to protect large swaths of land by sowing mines than by stationing soldiers. Local people used mines to obtain the same type of protection for themselves. Anti-tank mine fields dominate the region, combined with anti-personnel mines and often booby traps. Nobody kept records of their mine laying. Although some of them remember the location, nobody can tell for sure. Furthermore, the line separating the sides, usually the area of heaviest mining, moved several times, but you never know from where to where.

Javorac showed us one well-marked location where, close to the road, you can actually see an anti-tank mine that turned up during the demining operation, a round, plastic TMRP 6 with 11.24 lbs. of TNT that can be activated by 330 lbs. of pressure. The explosion of such a mine is so powerful that it can penetrate two inches of armor at 31-inch range.

The neutralizing of this mine is a very sensitive operation, a job only for experts. As with most of the mines placed in the country, it was made in Yugoslavia.

So many mines have been scattered, and they are being cleared at such a slow pace, that it is difficult



*Children playing war in the streets of Sarajevo.*

Photo c/o ICRC/René Clement

to designate a safe area for cutting down trees, for example. Right now wood in abundance is a necessity for residents of the area, who use it for heating, cooking and washing. People can get hurt collecting wood even when the terrain is completely familiar. It wasn't firewood but a cow that Ilija Javorac's neighbor Draginja Pertovic had gone to fetch when she was hurt by a mine three years ago. The cow had grazed in the same nearby meadow every day for weeks on end, but when Pertovic attempted to lead her back to the stable on this particular occasion, the animal pulled a trip wire and activated a mine that nearly took Pertovic's life. "I remember being very scared," she says of the days in the hospital in which she lay close to death. "I was not aware of what had happened ... and stupid thoughts ran through my mind, like 'What happened to the cow?' Unbelievable! At the moment, though, it seemed like the most natural question in the world." ■



notes  
FROM  
the  
FIELD

CROATIA

by Marijana Prevendar, United Nations Association of the USA



Ostoja and Ruzica Saric in front of their house. Red tape marks mined areas.

Photo c/o Marijana Prevendar/UNA-USA

The disintegration of the Federal Republic of Yugoslavia, accelerated by the Communist Party's electoral defeat, spurred the Republic of Croatia to declare its independence from Yugoslavia in 1991. As a result, forces from the Republic of Serbia, the largest republic in the former Yugoslavia, launched a campaign to block Croatia's drive for independence. The Croatian Serbs, backed by the Yugoslav government and armed with weapons from the Yugoslavian army, started an armed rebellion against the newly established Croatian government in 1991.

The conflict between Croats and Serbs continued until 1995 when Croatian forces repelled Serb advances and regained control of most occupied areas. These campaigns, known as Blijesak (Flash) and Oluja (Thunderstorm), restored the Croatian government's control over its territory, with the exception of Eastern Slovenia. This area was subsequently reintegrated into Croatia in 1996 as part of the Dayton Peace Accords.

Although the conflict in Croatia has ended, the legacy of nearly 1.5 million landmines deployed during the war remains. These anti-personnel and anti-tank landmines are buried in fields, around farmhouses and along roads throughout the country. Fourteen of Croatia's 21 counties report some level of mine contamination. It is estimated that 6,000 square kilometers of the country's total 56,538 square kilometers is affected by landmines.

Over 20 different types of landmines have been discovered in Croatia, including the MT-4, PMA-2 and PMA-3. These landmines were not only deployed by military forces, but also by paramilitary forces, which primarily used them to inflict damage on civilian populations and infrastructure. Further complicating the situation, very few records documenting the location of mines in Croatia have been kept, making it difficult to target specific areas for demining operations. Croatia now has the second highest concentration of landmine contamination in the world, up to 25 mines per square kilometer. To date, more than

400 civilians, including approximately 200 children, have been killed or wounded by landmines.

**Dragalic, Croatia**

Dragalic, along with its five surrounding villages: Donji Bogicevci, Gorice, Poljane, Masic and Medari, is located in the Western Slavonia region of Croatia. Just eight kilometers from Nova Gradiška, this municipality was exposed to intense fighting during the 1991-1995 Balkan war. In many instances, the front-line ran directly through the area. Hostilities were amplified when the Croats occupied the villages of Masici and Polijane and the Serbs held the villages of Donji Bogicevci, Dragalic and Gorice. As the conflict progressed, these settlements were frequently attacked, burned, or destroyed by opposing forces. Thousands of anti-personnel and anti-tank landmines were deployed, causing the municipality of Dragalic to become the most heavily mined region in Western Slovenia.

These conflicts shattered communal infrastructures and devastated the region. After the war, the once prosperous area, which included a primary school, post office, police station, farm cooperative, dairy processing plant, timber warehouse, veterinarian station and an outpatient clinic, was in ruins.

Many of the region's 3,000 inhabitants returned

**Nikola Katic, a resident of Gorice village, found himself in this situation. Unable to support his family without income from his crops, Nikola continued to cultivate his field, even though he knew it to be mined. Tragedy struck in March 1999 as he drove his tractor over a PROM-1 anti-personnel landmine.**

to find their agricultural fields, homes and grazing lands had been mined. Routine activities such as cultivating agricultural areas, were now life-threatening actions. Unfortunately, the need for food and income has forced many residents

to continue working their land, despite the dangers of landmines.

Nikola Katic, a resident of Gorice village, found himself in this situation. Unable to support his family without income from his crops, Nikola continued to cultivate his field, even though he knew it to be mined. Tragedy struck in March 1999 as he drove his tractor over a PROM-1 anti-personnel landmine. The

mine exploded beneath Nikola, causing him serious injury and head trauma. His wife Marija Katic was in the garden next to their house when the explosion occurred. She ran across the field to reach him, along with Rudolf Figuri, a neighbor. Marija remembers the 12 days of excruciating suffering her husband endured in the hospital before succumbing to his injuries. She and her daughter, Mira Svjetlanovic, are now unsure where they will go or what they will do. They no longer have anybody to cultivate the fields and have very little money to support themselves. Marija and Mira both hope that the fields in the area can be demined to prevent similar heartbreaks to other families.

Reflecting on the tragedy, Rudolf Figuri remarked that Nikola was only trying to support his family, he had little choice but to go to the field with his tractor and work. Although Rudolf, like many other people in the area, is now afraid to go into the fields, he continues to cultivate his crops. He recognizes the inherent dangers of his activities, but feels that he has no other alternative, although he has witnessed Nikola's misfortune and located and removed two mines from his own land.

All residents in the municipality of Dragalic face the same dilemma. Although landmines and unexploded ordnance have been discovered throughout the region, residents are determined to continue living as normal lives as possible. They use mined paths, fields and roads everyday or demine these areas themselves.

**Pakrac and Kusunje, Croatia**

The villages of Pakrac and Kusunje, located in Western Slavonia along the river Pakra and in the municipality of Pakrac, are centuries old. Pakrac, founded in the 14th century, is an area of great his-



One of a handful of local residents who remained in their home in the hills above the Sarajevo airport.

Photo c/o UNA-USA

# CROATIA



*Landmines impede reconstruction and the return of refugees.*  
Photo c/o UNA-USA

torical significance, containing medieval forts and buildings. Unfortunately, the 1991-1995 war between the Serbs and Croats inflicted heavy damage on the region. Hundreds of people were killed or injured and residential buildings, shops and infrastructure were destroyed.

The difficult task of rebuilding has begun. In 1996, a reconstruction and repatriation program was initiated. Since that time, 12,000 of the 29,500 residents have returned. However, the lack of infrastructure, residential buildings and employment opportunities has complicated this process. Before the war, most people worked in the wood, textile or agriculture industries. Sadly, the wood processing plant is now closed and the textile factory must be rebuilt. Agricultural activity is almost impossible because of the prevalence of landmines.

Approximately 110 square kilometers in the area is reportedly contaminated by anti-personnel and anti-tank landmines, which were laid during the Serbian occupation of the area. Although the Croatian government is attempting to clear the land, its efforts have focused on demining residential areas, including houses, buildings and areas 50 meters from these buildings. The funding and resources needed to demine large tracts of agricultural land do not exist. These efforts are further complicated by the fact that few adequate records exist of the location and types of landmines. This is because armed units were frequently rotated through the area and paramilitary organizations repeatedly deployed mines during the conflict.

Authorities have tried to address the situation by supporting mine awareness and education programs. Nevertheless, economic necessity often forces residents to enter mined agricultural and wooded areas. They also bury their dead and visit deceased relatives in two mined cemeteries in the region, continually placing their lives in danger. Veljko Dzakula, a mem-

ber of Pakrac's city council, has said that mines prevent the people of Pakrac and Kusunje from leading normal lives. Movement in villages is often restricted to the yards around houses and agricultural activity is severely impeded. According to Veljko, most people are killed by landmines while passing through the local forest from one village to another. Since 1995, 40 people have died in Pakrac municipality as a result of landmine related injuries, and many more have been seriously injured.

The experience of Bosko Goli, another resident of Pakrac, illustrates the psychological pressures that many landmine victims endure. This 45-year-old Serb worked in the wood processing plant before the war, but fled the area in 1995. After returning home in 1997, he had a near fatal encounter with a PMR-2A anti-personnel landmine. While walking in the Kalvarija forest near Pakrac, he accidentally pulled a tripwire attached to the mine, causing it to detonate. By chance, the shelter provided by surrounding trees and his distance from the center of the blast allowed him to escape unharmed. However, his good fortune is marred by the fact that the area is still mined and one of Bosko's cousins was recently killed by a landmine. As a result, Bosko continually fears for his life, the lives of his children and the well-being of his neighbors. Until the area is cleared of mines, the residents of Pakrac will continue to face the dangers of these indiscriminate weapons of war.

All residents of Croatia face the same dilemma. Although landmines and unexploded ordnance have been discovered throughout the region, residents are determined to continue living as normal lives as possible. They use mined paths, fields and roads everyday. Sometimes they demine these areas themselves. Only when the landmines and UXO have been completely removed will residents be able to live in a secure and prosperous environment. ■

***Stojan Radi, a 72-year-old Serbian resident of Pakrac, was wounded by a landmine.***

***After fleeing the area during the initial stages of the Balkan war, he returned in 1997 to find his house burned and his property destroyed. However, he was optimistic when a hunter told him the forested area around his house had been demined by the army. Believing it was safe, Stojan entered the forest to gather some chestnuts.***

***He inadvertently stepped on a PMA-3 anti-personnel landmine, severely injuring one of his legs. Unable to find help, Stojan cut off part of his leg and tied the rest with his belt to stop the bleeding. After more than two hours, a neighbor found him in the forest and drove him to the hospital, where half of his leg was amputated.***

***Today, Stojan is able to function with a prosthetic leg, but he finds it difficult to walk.***

notes

# FROM the FIELD

## The Ambitious Challenge of Adopting a Mine Field

by Larry Levine, President, United Nations Association/Monterey Bay



A sign showing that this area is being demined.

Photo c/o UNA/USA / Marijana Prevedar

**"For the rest of their lives, whenever reference is made to landmines, our donors will know that when given the choice between doing something and doing nothing at all, they chose to do something."**

Dropci is a tiny, devastated, and currently empty community of family farmers in northwestern Bosnia and Herzegovina, near the border with Croatia. Its people are still refugees from the war, as the land is strewn with landmines, booby traps and unexploded ordnance. Monterey County, Calif., is known as the "Salad Bowl of the World" for its agricultural abundance, the "Golfing Capital of the World," and the site of the spectacular Big Sur coastline. Dropci and Monterey County are worlds apart.

What is the cord that binds these two communities? The Adopt-A-Minefield Campaign, a program coordinated by the United Nations Association of the USA (UNA-USA) to raise funds for landmine clearance and to raise awareness about the global landmine crisis. The UNA Monterey Bay Chapter was among the first groups to consider working with UNA-USA to raise funds to sponsor demining efforts overseas.

When our chapter's Board of Directors first considered this concept in early 1999, there was considerable caution. The chapter had never undertaken a major fund-raising campaign before. It had no staff or consultants, no large mailing list or database, no major sponsors or wealthy members ready to help. At the same time, the Adopt-A-Minefield Campaign encouraged its sponsors to raise funds within four months of undertaking an adoption, so that the mine action centers could plan their demining schedules accordingly. We hated what landmines were doing to people and communities all over the world and we wanted to make a difference, so we accepted the ambitious challenge.

We focused on Bosnia, as our community had some ties to this country and everyone had at least heard of it because of the Bosnian war. From the mine fields available, we chose one in the family farming community of Dropci. We committed ourselves to raise \$33,500 to sponsor a month's work of the three teams of deminers and mine-sniffing dogs needed to turn the community back into a community. Sam and Edie Karas, long-time Monterey community leaders and UNA members, offered to chair the Campaign Committee. Their personalities lent inspiration and credibility to our campaign: Edie had been present at the birth of the United Nations in San Francisco

in 1945, and she and Sam had both served three times as official election supervisors in Bosnia. Retired Gen. Robert Gard, Jr., an internationally known advocate for banning and clearing landmines, agreed to be our Honorary Chair, leading a group that included former White House Chief of Staff Leon Panetta, our Congressman Sam Farr, and other respected local residents.

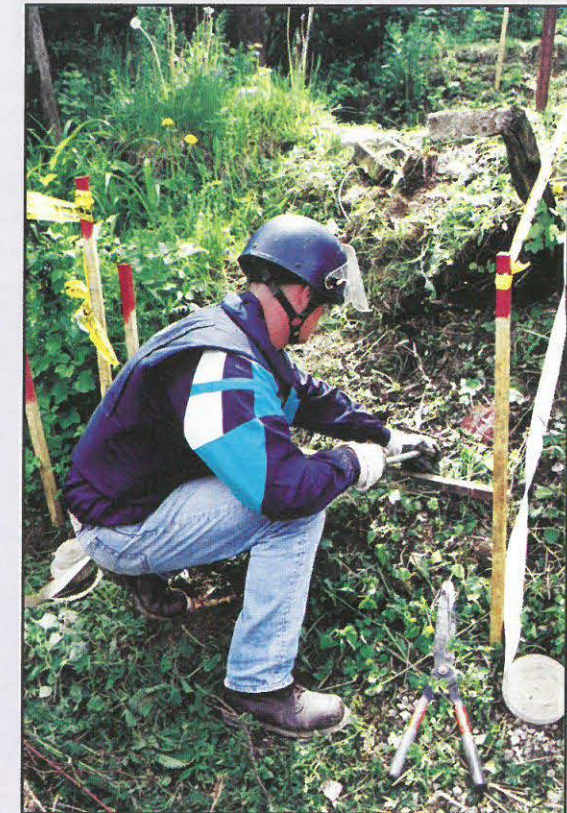
Our community is overwhelmed with fund-raising events, large and small, gala and low-key, so we decided to simply tell the horrendous story of the landmine crisis and ask for help, rather than plan one more series of banquets, film premieres, or rummage sales. Our committee created bulk mailings by hand, from lists they found in their desk drawers. We fought

for every bit of attention we could muster from the local press. We approached religious congregations, women's groups, service clubs, youth groups and businesses.

Our UNA members responded generously, along with many neighbors in our community from many backgrounds and perspectives. Thanks to the efforts of Princess Diana and the Nobel Peace Prize-winning International Campaign to Ban Landmines, we found that many local people had been concerned and upset about landmines for years, but had never before found an avenue to do something about it. One by one, the dollars came in, and we kept plugging away. In the end we received contributions from almost 500 individual donors, plus over 25 community organizations, religious congregations and businesses. Low and behold,

to our surprise and great relief, we reached our target of \$33,500 in early November 1999, two weeks ahead of our four-month goal, faster than any other community based group so far to successfully complete a local Adopt-A-Minefield campaign.

It's winter now in Dropci, but we know that soon after the snows melt, and the frozen Bosnian terrain begins to thaw, the mines will be cleared and the refugees will be able to return to their homes, their farms and the beginning of a new, more normal life. We know that we in Monterey County can never solve the global landmine crisis, but we also know that we can make a difference. For the rest of their lives, whenever reference is made to landmines, our donors will know that when given the choice between doing something and doing nothing at all, they chose to do something. ■



Deminer from NPA probing the ground for landmines.

Photo c/o UNA/USA / Oren Schlein



The work station of a deminer: inch by inch safe lanes are cut.

Photo c/o UNA/USA / Oren Schlein



The Adopt-A-Minefield™ Campaign engages individuals, community groups, and businesses in the United Nations effort to remove landmines around the world. The Campaign helps save lives by raising funds to clear mine fields and by raising awareness about the global landmine crisis.

The idea behind Adopt-A-Minefield™ is both powerful and simple. Designed to move beyond the political and policy debates typically associated with banning the use of landmines, the Campaign provides a practical solution to ridding the world of the tens of millions of mines that contaminate it. Adopt-A-Minefield™ combines elements of two successful national programs, Adopt-a-Highway and Sister Cities, and applies them to the landmine problem.

The Campaign seeks national and international sponsors to adopt mine fields that the United Nations has identified as being in urgent need of clearance. Sponsors raise funds in their communities to clear their adopted mine fields and return land to productive use. The cost of clearing these areas ranges from thousands to millions of dollars, depending on the size and type of mine field and the complexity of the demining task. Sponsors may adopt entire mine fields or contribute smaller amounts, which are pooled with other contributions. Every dollar raised is forwarded to the United Nations for mine clearance.

Adopt-A-Minefield™ is coordinated by the United Nations Association of the USA (UNA-USA) in partnership with the United Nations, the Better World Fund, the U.S. Department of State, and Medical Missions for Children. The Adopt-A-Minefield™ Campaign is formalized by an exclusive agreement between UNA-USA and the United Nations Development Programme (UNDP). UNDP has overall management responsibility for the Adopt-A-Minefield™ Campaign within the U.N. system and works closely with the U.N. Office for Project Ser-

vices, to whom it has subcontracted the coordination of Adopt-A-Minefield™ demining activities.

The United Nations undertakes mine action programs with the goal of developing local capacities to address the landmine problem. It works closely with national mine action centers to train local deminers and to certify that all mine fields are cleared according to international standards for humanitarian mine clearance. UNA-USA monitors this process and ensures that sponsor funds are properly allocated.

The Adopt-A-Minefield™ Campaign has been widely endorsed by the international landmine community. It is regarded as a model of the public-private partnerships envisioned by President Clinton when he launched the U.S. Demining 2010 Initiative, which seeks to eliminate the threat of landmines to civilian populations around the world by 2010. Adopt-A-Minefield™ has also been endorsed by Kofi A. Annan, Secretary-General of the United Nations; Ambassador Donald K. Steinberg, Special Representative of the President and Secretary of State for Global Humanitarian Demining; Jody Williams, 1997 Nobel Peace Prize Recipient; and the United States Campaign to Ban Landmines.

The hundreds of thousands of landmine survivors worldwide bear witness to the indiscriminate nature of anti-personnel landmines. While a mine can cost as little as \$3 to produce, it can cost up to \$1,000 to remove. Local communities in mine-affected countries often do not have the resources to clear their own land. They typically depend upon financial assistance from governments and international organizations. Adopt-A-Minefield™ is a grassroots effort to provide this aid. It is our hope that in the process of raising funds and mine awareness in communities around the world, sponsors will establish long-lasting bonds with the mine-affected communities that will benefit directly from their efforts. ■

Adopt-A-Minefield™ Campaign  
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UXO and landmines litter the villages.  
Photo c/o CARE/Jacob Holdt

## A Serbian Ghost Town in Need of Recovery

■ by Sinisa Malesevic, UNA/USA

All sorts of people are hoping for the demining and reconstruction of Dropci, a “Serb village” approximately 45 kilometers from the municipality of Bihac in Unsko-Sanski Canton, located in the Muslim-Croat Federation of Bosnia and Herzegovina. This area was strategically important during the war, and much was done to protect it, which means there are plenty of mine fields. The few hundred people who lived here before the war (1992-1995) have all left.

Among those cheering for Dropci’s recovery is Amir Memic, who lives in Kulen Vakuf, a Muslim village close to Dropci, and who teaches in a primary school nearby. One of his reasons is practical: “If Dropci is reconstructed,” he says, “we could use its system of power lines to ensure a steady supply of electricity to other villages as well.” Memic is also hoping that once conditions improve in Dropci, Serb families will return to the village. “The war is over and we can live together now,” he says, “but we cannot know that before we give it a try.”

“We suggested this location for mine clearance because we believe that people would return,” advises Izet Ismirevic, who heads the Bihac Civil Defense office. In fact, Ismirevic adds, “people who lived here have contacted us already and say that all they want is to come back.”

Ismirevic says that another reason why Dropci is a good candidate for demining and reconstruction is that “the project itself is not so big, so in a relatively short period of time we would achieve a lot. And the municipal authorities could help a lot by reconstructing some of the facilities that were destroyed.” What the local government can’t deal with, however, are minefields. “Our municipality has no demining capacity to carry out such a task,” notes Ismirevic, “and the economy is not strong enough to support the operation. We need help in demining, and we’ll find the way to do the rest.” “The rest” includes restoring the electric power lines destroyed during the war and building a new water supply system.

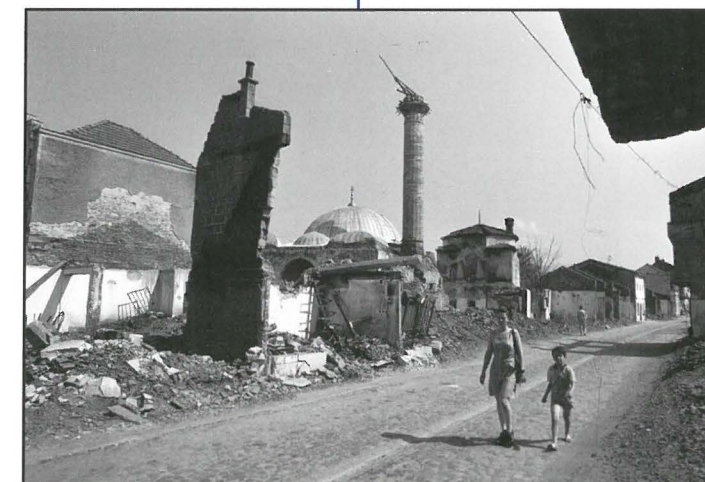
Clearing the mine fields would help the overall

economic situation too. “Since industry is not very developed here,” Ismirevic points out, “most people earn their income from agriculture. Even those who work in government agencies or private companies, where the average salary is very low, have to grow things for their own consumption. Most families have cows or chickens or pigs, and all of them need fields – some for feeding cattle, some for plowing and growing things.” Right now, though, there is no telling which of these fields is mined.

The Dropci area has very few mines of the home-made variety; most of the devices placed here are of Yugoslav manufacture, often PMR-2A and PMA-3 anti-personnel mines, designed to injure or kill. One man died from a landmine injury on a visit to the village to see his house. No one has visited since.

“It is actually good that people are afraid,” says schoolteacher Memic, “because while they are afraid, nobody goes there and nobody gets hurt.” He and the municipal authorities now have a chance to prepare a proper mine awareness program for children as well as for adults. “I expect we’ll have some difficulties with the latter group,” Memic says, “because they’re apt to think they already know enough, and they often don’t have time for the classes.” The situation with children is different, he notes, since most of these classes are held during school hours, and the youngsters tend to like the mine awareness classes.

“We talked about this with mine awareness personnel of the mine action center,” says Memic, “and they have promised us support and help. They’ll begin by sending their instructors,” he notes. “Once it gets going, I’m sure it will be fine!” ■



This Mosque and its surrounding houses were destroyed by the bombardments.  
Photo c/o ICRC/Boris Heger

notes  
FROM  
the  
FIELD

THE LEGACY  
OF WAR IN  
C·H·E·C·H·N·Y·A

by  
Kimberly P. Hill

Hundreds of lives are destroyed daily; most of which are left unrecorded and unacknowledged. The struggles and suffering of a few bears witness to the atrocities of many forgotten casualties and even survivors of all ages. The epidemic of landmines continues to devour many lives in its path, but it is the aid of others and the written words of some that convey the true horror of their reality.

War Zone—Grozny

The heat pounded down upon the necks of two figures standing on the stairs as they glanced around at the void that was once their home, but now lay in ruins. They lit their cigarettes and continued to smoke as they probed beneath the surface of the debris. The smoke was a screen the two used in hopes of dissipating the stench that permeated throughout the rift in their basement. The dust spun around them in circles, gagging the two survivors as they stared down into the hole, bewildered by what was left before them and sick from the smell of the victims left behind. The two 15-year-old boys, Magomed and Ruslan, stood at the opening in amazement at the devastation. Magomed said emotionlessly, "Corpses. There are still a few of them down there, but we leave them because it is too dangerous to try to clear them away." Magomed and Ruslan also spoke about explosions and bombs that would flash across the night sky leaving their town paralyzed with fear and at the light of day, shattered from the damage. At the age of 15, an age of innocence for many, these two boys were left to pick up the remaining pieces of their lives and attempt to mend them back together, despite the ongoing war.

Fatima Umarova, a farmer in the village of

Goiskoye, south of Grozny, looked over the fertile plains, which extended beyond her yard to the edge of the foothills of the Caucasus Mountains. She looked upon this untended land as a death trap waiting to destroy what was left of her family. Her life has been torn apart and now, although she is mending her home, she is still left to face many of the continuing horrors of war. All of the Umarova's cattle were sacrificed in the war, so they are not forced to venture into the dangerous fields as much, but many families are faced with the daily challenge of sending



Before the fighting intensified, humanitarian aid was available to the citizens of Chechnya.  
Photo c/o ICRC / Charles Page

their sons into the mined pastures just to herd their cattle and make a living. The majority of landmine victims are children. They are often gathering wood, tending to animals, and, like any child, exploring.

Upon arriving in Chechnya, HALO Trust, a British charity dedicated to disposing of explosive debris across the world, said, "There is an urgent need for demining in Chechnya." Their teams discovered a total lack of equipment, training and organization despite the constant support of the Chechen government. HALO theorized that a year's worth of work would cost up to \$1 million to safely clear the areas needed. The need for reinforcements in Chechnya continues to grow because even as the teams disperse and begin their demining, Russian troops lay more landmines, counteracting everything that the teams have established. ICRC member, Paul Costella, said, "Mines are defensive weapons. They are cheap and simple to use and they are a vital part of the former Soviet military doctrine." ICRC has also been one of the forerunners in the attempt to get humanitarian aid to the civilians in Chechnya. ICRC, like HALO trust has unfortunately been forced to evacuate Chechnya until safety can be guaranteed.

Shamil Basayev, a separatist senior militia commander, returned to Chechnya in hopes of clearing away the landmines, but found that without the aid of maps and special equipment, he was of little help. As of the 1980 protocol, maps of the mine fields were encouraged, but most have been lost or destroyed during the succession of wars. The original protocol never mentioned the use of landmines in an internal conflict, like the detachment of the former Soviet Republics. A new condition to include the internal conflicts came into effect in 1999. Another approach to demining was to utilize the people who originally laid the landmines, but most had died in the course of the wars leaving the survivors clueless as to mine field marking.

The Russians have randomly dropped thousand of "leaf" bombs into the woods and mountains, killing innocent and unsuspecting civilians. Many say, this current war has been a war against the civilian population, an ethnic cleansing. Unfortunately, this bombing of civilian targets happens everyday and shatters thousands of lives. Injured victims face another challenge, the hospitals. Over two-thirds of the hospital facilities in Chechnya were destroyed during the previous war (1994-1996). The main hospital in Grozny was bombed in 1996 by the Russians. The hospitals in Chechnya are under-staffed, un-equipped and hundreds of new victims arrive in search of treatment. Most of the staff are volunteers, as they have only received three months pay for the

last two years. The prosthetic facilities are just as cumbersome because of the lack of funding and support. As of 1999, reports showed that over 3,500 people were in need of artificial limbs and the only landmine victims who receive the prosthetics are those who have enough money to buy one. There are no real rehabilitation programs in Chechnya. People in need are funneled into other programs in nearby countries.

A spokesman for a Russian arms dealer, Rosvo-oruzheniye, stated that Moscow now complies with an international export embargo which prohibits them from selling the landmines outside of the country, but the internal affairs still rage on unaffected. The Russian government is not the sole proprietor of these deadly weapons, as corrupt or financially challenged military personnel also sell these weapons to any and all that supply them with the money. One woman, Rosa, a Chechen nurse stated that, "the Russians will even deliver it." This concept is one of the reasons that demining is so frustrating because it seems as through these 'easy killers' will never disappear because of the availability in which they can be received. Whenever a conflict arises, the landmine is one of the first weapons chosen because of the ease of obtaining them and using them to protect the positions of both sides.

The plague of landmines continues to sweep further and further across the borders of Chechnya as landmines are indiscriminately laid by the Chechen rebels and the Russian army. Many believe that the future of this country as well as several other Republics is bleak and that the hope of peace seems ages away, but several NGOs and countries in the European Union are strongly encouraging Russia to pursue a diplomatic settlement to the current war. One western military expert said, "Mines are the last line of defense and they [Russians] have nothing else to replace them with. In the West, diplomacy is replacing mines. Once Russia's policy changes and relations with its neighbors are no longer hostile, there is hope, but that will be some time in the future." ■



Orthopedic Center of the Ministry of Health in Georgia.  
Photo c/o ICRC / François Friedel

notes  
FROM  
the  
FIELD

A Diary of  
Destruction in:  
Bosnia



*Moshor, Bosnia and Herzegovina.*  
Photo c/o UNA/USA / Oren Schlein

by Oren J. Schlein  
Director, Adopt-A-Minefield™  
United Nations  
Association of the  
USA

During the Bosnian war in the early 1990s, Croat, Muslim and Serb forces deployed between 600,000 and 1 million anti-personnel landmines. This can seem a meaningless figure until you see the effects of both exploded and unexploded landmines. Driving into town from the Sarajevo airport, I witnessed the striking contrast between the beauty of the hills surrounding the city and the pockmarked buildings damaged by relentless shelling during the Bosnian war. The old town has been largely restored to its historical charm, while the rest of the city and outlying areas continue to exhibit the awful blemishes of war. I had come to Bosnia to meet with representatives from the local mine action centers, to discuss the progress of the Adopt-A-Minefield™ program in Bosnia, and to visit several mined areas.

After a day's orientation in Sarajevo, I headed north with my Bosnian driver to the city of Doboj, about 75 miles away. The trip took approximately two hours, through winding roads along the Bosna River. As we approached Doboj, we crossed the river, which skirts the southern edge of the city and which demarcated the confrontation line during the war. The main bridge leading to town had been destroyed and was replaced by a makeshift bridge constructed by SFOR; the NATO-led Stabilization Force deployed to maintain the peace in Bosnia. These makeshift bridges dot the entire country.

We visited a village on the outskirts of Doboj called Makljenovac, a small community with a few dozen houses built on a hill overlooking the Bosna River on one side and the city of Doboj on the other side. The area was the site of intensive fighting between Serb and Muslim forces during the war, which tore this Serb and Muslim community apart. Makljenovac is typical of many Bosnian communities that have been affected by landmines. Most of the homes and buildings have been damaged or destroyed, large tracts of land have been mined, and the majority of the villagers live as refugees elsewhere in Bosnia and in neighboring Serbia. The village has received some international funding to aid the

demining and reconstruction effort. Like much of Bosnia, however, there has not been enough funding to adequately restore the community.

Makljenovac's primary school is located at the highest point in the village and was extensively shelled during the war. The playground and surrounding area are now littered with landmines. The school is one of 10 sites in Bosnia that have been adopted by Adopt-A-Minefield™ sponsors who have raised funds to remove landmines in mine-affected communities. The village was eerily quiet and desolate when we visited it. A handful of villagers returned after the war and have done their best to reclaim their lives. A lucky few have been able to repair their homes to a livable state, largely with the assistance of the Office of the United Nations High Commissioner for Refugees, which has also cleared small tracts of agricultural land for use by the villagers.

After visiting Makljenovac, we visited the small town of Skipovac, a farming community 30 kilome-

ters from Doboj. Skipovac is a tranquil village along the former confrontation line. A few dozen houses line the main road through the town. Most of these homes are deserted, as are the local schoolhouse, the post office and the general store. Skipovac is heavily contaminated with mines — nearly all the agricultural land in the village is unusable. Only a handful of residents stayed through the war. Some villagers

have since returned, but life is difficult. The few children that live in the village have to walk 30 minutes each way to school in the adjoining village of Sjenina Rijeka and both sides of the road on which they travel are heavily contaminated with mines. The villagers live in constant fear that one of the children will inadvertently activate a fragmentation mine. Skipovac suffers the fate of many Bosnian towns. It is isolated and largely dependent on itself for food production. The presence of mines, however, makes it extremely dangerous to cultivate land. While the majority have heeded the warnings of authorities and not done so, some villagers, including an elderly couple who remained during the war, have decided that the need to grow food to survive outweighs all risks. The villagers of Skipovac have been lucky, but every so often in Bosnia, there is an ill-fated attempt to cultivate land that results in death or injury.

My next two days in Bosnia included visits to the Bosnia and Herzegovina Mine Action Center



*Doboj, Bosnia and Herzegovina. People still try to cultivate their fields and gardens despite the landmines.*  
Photo c/o UNA/USA / Oren Schlein

ters from Doboj. Skipovac is a tranquil village along the former confrontation line. A few dozen houses line the main road through the town. Most of these homes are deserted, as are the local schoolhouse, the post office and the general store. Skipovac is heavily contaminated with mines — nearly all the agricultural land in the village is unusable. Only a handful of residents stayed through the war. Some villagers

(BHMAC) in Sarajevo and the two entity mine action centers in the Muslim/Croat Federation and the Republika Srpska. The entity mine action centers were established to reflect the political, ethnic, and religious makeup of the country. Each entity mine action center conducts mine-awareness and risk reduction programs, demining training, Level-one mine field surveys, mine field marking and mine

# Bosnia

clearance operations in their respective territories. They also provide information to the BHMIC central landmine database and set work priorities. These activities enable the mine action centers to address the specific needs of the two Bosnian entities to develop sustainable, decentralized capacities to address the landmine problem.

day. Representatives from the Federation Mine Action Center served as my tour guides on this occasion. I was required to wear a flak jacket and always stayed closely behind my guides.

Our first stop was a neighborhood located in the hills above Sarajevo from where Serb forces had shelled the city below during the war. They occupied hundreds of homes in these hills, forming an almost impenetrable line of defense many miles long. Nearly all the homes had been shelled and fired upon, ransacked and heavily mined. There have been, and continue to be on occasion, many mine-related injuries and deaths in the area.

Norwegian People's Aid, a non-governmental demining organization, was clearing the area of mines during our visit. They had been here for several weeks, painstakingly searching for mines an inch at a time. Given the hilly terrain, the dense, overgrown bush and the rubble left over from the war, probing the ground manually was the most efficient demining technique. Neither dogs nor mechanical demining machines, which are so useful elsewhere, worked here.

As I surveyed the area and watched the deminers in action, I was surprised to see an old woman walking up the hill right beside the deminers and further amazed to see several children playing in the street below. It was only at this point in my trip that I realized just how precariously the people in mine-affected communities live. An inadvertent mistake by one of the deminers or an overenthusiastic child straying off the main street could easily detonate a mine, resulting in death or injury to all those around. The real danger of landmines is that they remain active after hostility ceases and this once again became abundantly clear when we visited the second neighborhood on our tour.

The southern suburbs of Sarajevo occupy largely flat expanses of land. Like so much of the city, many of these communities were destroyed or badly damaged during the war. We visited a community of several dozen houses surrounded by fertile agricultural land. None of the houses were habitable, nor was the land cultivable because the area had been heavily

mined. My guides took me to this neighborhood because there had been a mine accident earlier that morning.

As we arrived at the scene, I was stunned by what I saw. We walked up to the second story of a house whose frame was a reminder of the home that used to exist there. No more than 30 feet away was a large crater in the ground and at least a dozen dead sheep. More than 100 feet away lay at least two dozen more dead sheep. One of the sheep had detonated a bounding mine, which had leapt up in the air and scattered its fragments in a 360-degree radius. All the sheep in the field died instantly. A lone shepherd, struck by grief at the loss of his flock and his livelihood, wandered aimlessly through the field. He was oblivious to the warnings of the deminers to leave the area, which could easily contain other mines.

As I left Sarajevo the following day, I was haunted by the image of the shepherd. Did he survive or did he fall victim to another landmine? It is a sobering experience to travel through hundreds of miles of small rural communities and large urban cen-

ters and witness firsthand the devastating, indiscriminate impact of landmines. Their legacy in Bosnia is all encompassing. While the magnitude of the landmine problem is overwhelming, small measures of support, whether financial or in-kind, do have a considerable impact on the lives of those individuals and communities they are intended to help. Together, we can all clear a path to a safer world. ■

*Oren J. Schlein first became acquainted with landmines in March 1997 when he listened to an interview with Ken Rutherford, an American aid worker who lost both of his legs in a landmine explosion in Somalia. Mr. Schlein is the director for Adopt-A-Minefield. Mr. Rutherford is the co-founder of Landmine Survivors Network.*

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*Bijelo Polje, Koshos, Bosnia and Herzegovina.*  
Photo c/o UNA/USA / Oren Schlein

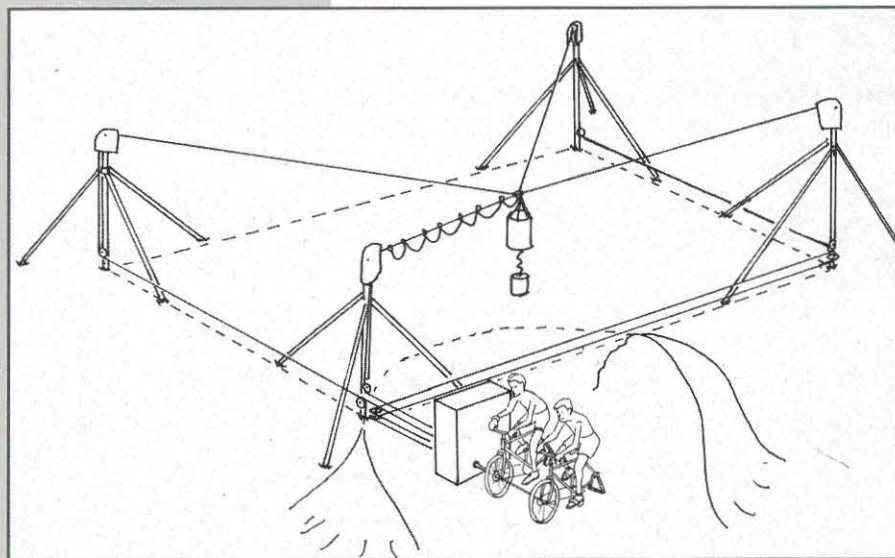
In all my discussions with mine action officials, a constant theme emerged — villages, towns and cities everywhere continue to suffer from the presence of landmines, several years after the war has ended. Despite the best intentions of the mine action centers, limited funding hampers their efforts to solve the problem. The plight suffered by so many Bosnians is that mines prevent the cultivation of land and the reconstruction of homes, which in turn prevent the return of refugees and the recovery and development of local economies. Hundreds of communities and thousands of lives are directly and indirectly affected by the mine contamination problem.

I concluded my trip to Bosnia with an emotionally charged visit to two very different mine-affected residential areas in Sarajevo. It is hard to capture the adrenaline rush that I experienced as I walked through these mined areas. I had spoken to many deminers and mine survivors, but nothing prepared me for this



*Sarajevo, Bosnia and Herzegovina. A shepherd investigates his flock of sheep a few minutes after they have been killed by a bounding mine. He entered the area despite warnings not to do so.*  
Photo c/o UNA/USA / Oren Schlein

# The Actuator: DEMINING INNOVATIONS



Sketch of a conceptual 4-pole system driven by power from two stationary bicycles. Straight broken lines indicate the extent of the parcel of land to be probed. The actuator is suspended at the juncture of four cables extending from the corner poles. Pulleys conduct these cables to the rectangular housing containing the electromechanical parts, including the clutches operated by the microprocessor. Power is transmitted to the actuator through a wire suspended from the near pole along its cable. A protective earthen berm (curved solid and broken lines) is shown cut away to expose the elements at the near pole.

Graphic c/o L. Felsenstein, T. Wright, E. Brechin. Caption c/o Felsenstein and Saunders

by Lee Felsenstein and Steven E. Saunders, Ph.D.

This approach to humanitarian demining differs from generally accepted methodology. It has not yet been tried, and the purpose of this article is to ensure that the general concept is placed in the public domain, where it may be debated and modified without considerations of intellectual property. Interval Research Corporation, where this idea originated, is not in the business of mine clearance, or of manufacturing mine clearance systems, so the idea is being passed along to the community best capable of analyzing it.

Mines are built to destroy themselves when triggered by an external event. If we can simulate the triggering event adequately, we can clear an area of mines by detonating them on site. For anti-personnel mines this means simulating the tread of humans to the necessary degree of impact and repetition. During this process the system used must not be seriously damaged by the detonation of mines, and operating personnel must be kept safe.

In accordance with John Walker's concept of "Moore's Law in the Minefield," <http://www.fourmilab.to/minerats>, our system is intended for local manufacture and assembly using one or more high-technology components produced in high volume at low cost. Our concept differs from Walker's semi-autonomous "mine-rat" robots in that ours is a stationary system erected on a parcel of land able to probe the entire surface of the parcel to an arbitrary degree of fineness.

Military doctrine opposes on-site detonation. At-

tempts at clearance by flails and similar devices have proven unreliable and likely to render unexploded mines hypersensitive. It is our observation that those devices are relatively expensive and are typically applied to the task for a short time under control of skilled personnel. We propose instead a system that works over a much longer period of time under control of local personnel using local energy sources.

The system we envision would consist of three or four well-braced upright poles holding pulleys on a plane above the mined ground. Positioning-cables feeding over these pulleys would join at a central point, where the "actuator" would be suspended. This actuator serves the function of probing using a weight to simulate the human triggering effect.

Positioning systems such as this have been used for positioning cameras over large open areas ([www.august-design.com/html/projects/prj\\_skycam.htm](http://www.august-design.com/html/projects/prj_skycam.htm)) and the use of such a system in a demining application is described by Havlik and Licko (See vol. 2.2 of *The Journal of Mine Action* <http://www.hdic.jmu.edu/hdic/journal/2.2/features/havlik.htm>).

Several different methods of actuation are possible. One might be a bundle of chain mail raised and dropped repeatedly. Another might consist of a water-filled bag made of cheap plastic drawn or rolled across the surface. We claim no expertise in actuator design and recognize that optimum actuator design will not be determined without extensive testing. Power to operate the actuator would most efficiently be transmitted mechanically by additional pulleys run from the poles.

The fundamental principle of operation is that the control module knows the position of the actuator on the horizontal plane at all times, probably through electronic sensing of cable extensions as processed through simple trigonometry. The control module would contain dedicated microprocessor controllers operating on input signals from sensors located on the suspension poles. The poles then control the electrical actuation of clutches, which apply prime motive power to the positioning cables.

The 'closed loop' is formed by the path from cable extension sensors through the microprocessor and its software, to the clutches and to the extension of the positioning cables. Reference monuments would be necessary to allow the system to recalibrate itself, given the inevitable shifting of the poles. The

software controlling operation would be built into a protected control module in the form of read-only memories (ROMs). The control module would be built to move the actuator successively over every element of the surface below it, and to remember the last point at which the actuator probed. The operators would have a few commands; start, resume, recalibrate, and stop. The operators may choose to run the system through as many complete passes over the mined land as they desire.

Prime motive power for the system need not be electrical. A shaft would be provided which may be turned by whatever power source is available. The operation of the shaft would generate sufficient electrical power to operate the control module and its clutches, in addition to mechanically performing the shift, drop and lift functions of the actuator. Persons involved in the operation on site must, of course, be protected from the fragments generated by mine detonations by beams or similar obstacles.

This system is intended to take advantage of economies of scale and the low cost of local labor. It should be distributed by a multi-tiered system involving training of local personnel in the process of installation and maintenance, and in the training of on-site operators. Control modules and other high-tech components would be contracted for and distributed by organizations having an interest in promoting mine clearance at low cost. Lower-technology items would best be manufactured locally, and tools and training may constitute the imported items in this case.

The manufacture of the control modules would best be done either by one concern (thus maximizing the volume of units over which to amortize expenses) or by a number of smaller concerns building to a standardized design, thus allowing for price competition (although quality would have to be monitored rigorously). The design of such a system, capable of being built from varied locally sourced materials and operated by minimally trained personnel, will not be a simple task. Achieving the necessary reliability of operation from the controller components will require the application of software design techniques perfected in the automotive industry.

It may be appreciated why no benefit would accrue from patenting or otherwise protecting the gen-

eral system design, since assembly of the system would take place far from any mechanisms for enforcing such ownership. The systems should, we believe, be paid for and owned by the local people or community whose land is being cleared, so that the effects of proprietorship will be manifest. The "sale" of the system components (which will be partially subsidized) should, we believe, include an agreement to resell at controlled prices, perhaps through the agency handling distribution and training in the local country. In this way the allocation of the components goes first to the locality that can raise the initial price, which is then refunded (less depreciation) by the next purchaser and so forth until the components wear out. This would, we hope, be a long time, given that each user sees the components as valuable property to be protected from depreciation and sold off as soon as its local use is complete.

Some might object that we are postulating a billiard-table environment whereas the real world is much more complicated. We acknowledge, of course, that paths will have to be cleared manually to allow the erection of this system on mined land. It is less difficult to demine manually a linear path than a whole field. The presence of brush overgrowing the mine field is an obstacle that can be addressed by fitting brush-clearing attachments to the actuator so as to allow for safe removal. Manual control of the actuator movement may be necessary for this phase.

We also acknowledge that our proposed system will not clear mines in all terrain and circumstances. But we believe that it can be greatly useful in clearing mines in a large number of locations, thus freeing human resources to clear mines in more difficult areas.

Demining is tedious, life-threatening work, which requires that every bit of the field be swept or probed. What better task to pass to a machine, given that computers are only good at tedious, repetitious actions? And why not let the mines blow themselves up if only the machine will feel the blast (and be easily and cheaply repairable)? To the design philosophy now stylish in Silicon Valley, expressed by the phrase "fast, cheap and out of control," we counterpose a different ethos of "slow, cheaper and highly repetitious," which will better serve those who live with anti-personnel mines in their ground. ■



EVALUATION AND CERTIFICATION  
OF HUMANITARIAN DEMINING  
DETECTION EQUIPMENT

QUALITY  
ASSURANCE

by Vjera Krstelj, Josip  
Stepanic, Jr. and Irena  
Leljak

An extensive number of humanitarian demining detection equipment (HDDE) in the development phase requires a well-established set of testing facilities. A combination of enthusiastic and scientific testing exists throughout the majority of these facilities. During the last several years, the process of humanitarian demining (HD) in Croatia has begun under the intense effort of the Croatian Mine Action Center and other institutions. The success in starting and performing the clearance of various mine-affected regions was a combination of mechanical demining and a systematic approach. Mechanical demining has given good results on the agricultural terrain and in the fields of homogeneous soil compositions with smooth surfaces. In other situations, where the terrain is impenetrable, the pyrotechnicians have conducted manual demining. Manual demining, however, is a risky task that requires more time and results in more victims.

The slowest part of the demining process is the actual detection. Anti-personnel landmines are harmful because of their unknown positions. To lower the risk in HD, the anti-personnel landmine positions need to be determined slowly and carefully. The languid speed of this demining process has prompted the scientific community to consider existing detecting methods, and to try to establish new ideas and suggestions using its scientific potentials in HD speed increment. The community's response united experts and groups on the development of various methods, equipments and procedures for HD needs, but only few of the methods and equipments reached the implementation phase. The procedures, although sometimes contradictory, were used for their detection methods or equipment reliability. A question arises, then, how to perform the capability test in order to have a reliable, globally accepted procedure for HDDE assessment? Unfortunately testing methods do not always follow the HD procedures. For example: a demining machine which is frequently damaged and pieces of high metal content fall into the soil, make metal detectors more difficult to use.

Procedure for performance demonstration of metal detectors is one of our main focal points because such a procedure should be considered as a part of a

complex HD process. In designing a procedure we have to consider many different aspects, including peculiarities of a soil type, the details of the equipment performance demonstration, and the equipment needed for the demining process control. In other words, after thorough testing in laboratory conditions, the personnel involved in the development of the demining equipment should go to the field and apply the technique and equipment in a real mine-affected area.

#### Organization of Humanitarian Demining Detection Equipment Testing

Generally accepted HD detection methods and techniques do not exist yet, as all prospective candidates are still subjected to theoretical and experimental work in various proportions. While the theoretical part of research and development is a never-ending process, the experimental part, the key part of the development process, incorporates the two mutually. Researchers must perform experiments in an atmosphere of complete concentration in order to accurately gauge the development and improvement of the equipment. Researchers' maneuvers must be limited as little as possible, and therefore testing should occur at HDDE testing sites. The highly controlled experimental environment minimizes the risk for equipment deterioration during its testing.

Experiments, however have to be carried out in conditions that closely follow those of the mine-affected areas. In such circumstances, risk is augmented considerably and the researchers' concentration on the equipment performance could be lowered drastically, influencing the overall observation and opinion essential for conclusions regarding the equipment's performance and development. The safety procedures invoke additional limits to the researchers' mobility, but all the relevant characteristics of the system consisting of the landmine and its environment are still unknown. Only by means of this type of experiment can the insight into reliability performances be estimated in HD.

Experimental testing, therefore, should consist of two parts. First, experiments are to be performed in a controlled laboratory environment or related test sites. Then, experiments are to be conducted in the representative setup of real mine fields. With that combination, we expect predominant conclusions about the equipment development and a strong rate of efficiency on reliability. The second part involves tallying every possible and unintentional variable. For

the equipment tested, this part serves as a final control point. The testing laboratory should be organized according to the experience gained, taking into consideration each parameter influencing mine-affected areas. Relatively soon we will be in the position to combine laboratory and field condition results.

#### Need for the Standardization of the Demining Equipment Testing

There is a clear difference between scientifically based equipment testing and testing out of necessity. In order to minimize risk and maximize the reliability result, relevant results existing already in the scientific field should be incorporated with the new testing. This method should give a clear view of the particular set of testing equipment, which serves both its manufacturer and end-user. Additionally, it gives the final user preliminary confidence in the equipment performance. Past casualties in various performance testings were caused by the improper usage of equipment or by unprepared personnel. The scenario of the proper experiments designed for the equipment testing, described in the previous section, will minimize these accidents.

In HDDE testing, we worked by using the iterative approach so that quality improvement of our procedures is constant. The basis of this approach is a collaboration of expert groups, members of scientists with experience in those fields that coincide with HDDE needs. In order to establish the quality assurance for HDDE preliminary testing, a confirmed relationship between the laboratory and field part of testing was created. The testing of important parameters defining landmine detection equipment is covered in all important aspects, and the evaluation of this testing is judged by a critical mass of experts. HDDE testing should be performed only by using a controlled laboratory and test sites to establish the quality assurance for all HDDE.

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Tempest cutting  
vegetation in a live area  
in Bosnia  
Photo c/o Russell Gasser

# Developing New Technology for Humanitarian Demining

by Russell Gasser and  
Terry Thomas

Despite the spending of hundreds of millions of dollars on high-tech research over the last few years, local humanitarian deminers still use traditional prodders and metal detectors. The biggest recent technical innovation has been mechanical vegetation clearance which was mostly developed in the field and bypassed the research route.

An understanding of technology choice makes it clear why this has happened and can help us avoid following too many dead-ends in the future. Research should generate viable new options, and technology choice then helps select which one to use. However, the critical word is *viable*. Innovations that are very expensive, risky, hard to fit into existing work practices or that do not address high priority problems are not viable. If the innovation process is not *driven* by potential users but is instead controlled by distant outsiders it will usually be fruitless. An experienced field practitioner always has as much to offer as the expert in the laboratory; it is the combination that is most productive. In humanitarian demining research such a combination is rarely found.

The Development Technology Unit (DTU) in the School of Engineering at Warwick University has a methodological approach to humanitarian demining research. After 12 years of active research in appropriate and sustainable technology with project partners in 10 developing countries, new work is based on what has been learned about the types of technology that really promote development and are

suitable for use in these countries. In all its humanitarian demining research, contact with organizations in the field and visits to mined areas are used to keep the end user as an important partner in the whole process of engineering R&D. This keeps the focus on types of technology that actually work in the field and that deminers really want, though of course it does not mean that every idea is successful. As part of a university noted for its excellence in high-technology research and engineering, the DTU takes full advantage of access to information and expertise in a wide range of technical disciplines.

To date, much of the DTU humanitarian demining program has focused on the development of equipment that can be *produced* in heavily mined countries. An independent British charity, the Development Technology Workshop (DTW) has been established to undertake much of the technology transfer work; one notable success has been helping local people establish the Cambodian Demining Workshop (CDW) in Phnom Penh. The CDW is a Cambodian small business that now employs 23 local people, 60 percent of them with disabilities and half of them women. The CDW products are prodders, visors, protective clothing and other demining equipment. Similar small-scale production can easily be established in other heavily mined countries where there is demand, the technologies used are all transferable. The CDW and DTW between them also manufacture (in Britain and Cambodia) the “Tem-

pest” vegetation mini-flails—these radio-controlled machines weigh two tons and three are currently working with demining NGOs in Bosnia and Cambodia.

Technology choice often involves comparing high-tech, imported equipment to traditional locally made alternatives that are not as fast, but are much cheaper. In humanitarian demining the choice has to be between different speeds and costs and not just different levels of safety. Using less safe equipment just because it is cheaper has effectively been ruled out as there is an over-riding requirement to protect professional deminers. Risk assessment methods clearly show that rapid clearance of as few as 80 percent of the mines in an area could halve the casualties over the next 20 years compared with the current near-perfect but very slow method [[http://www.hdic.jmu.edu/hdic/journal/3.1/features/risk\\_brown/risk\\_brown.htm](http://www.hdic.jmu.edu/hdic/journal/3.1/features/risk_brown/risk_brown.htm)]. The large decrease in civilian casualties would be accompanied by a small increase in deminer casualties and that simply is not acceptable.

In contrast to most trades, deminers must be able to use all their tools and equipment effectively from the first day they work in a live area. A humanitarian deminer cannot start as an apprentice with a few limited tools and skills and gradually increase both. Working alongside and watching an experienced deminer is also dangerous and unacceptable. It places a heavy demand on the designers of tools and equipment to avoid any operating methods that depend too heavily on detailed experience or having gradually learned a subtle feel or complex instructions.

There are similar problems in the innovation process itself. Testing prototype demining equipment is nearly impossible. Prototype safety equipment, and demining tools that are not quite good enough yet, or maybe have hidden faults, cannot be tested thoroughly in live areas. This is becoming even more important as microprocessors start to be used in almost all metal detectors. The computer software that the microprocessors use cannot be exhaustively tested to prevent against all eventualities. Limited testing with surrogate mines is the best that can be done, but tests on a small number of items cannot guarantee adequate performance under all circumstances. This is a strong argument in favor of improving existing tools that work well and abandoning work on very complex new equipment no matter how good it may promise to be.

Much of what has been written on “appropriate technology” deals with technologies for production. Humanitarian demining produces land that is free

from mines. This view of demining as “producing” usable land can be helpful in looking at which technologies are likely to succeed. If a technology looks completely unsuitable for use in a production environment in a factory in a particular mined country then it will probably not be suitable for use in the field. Improved productivity (increase in area cleared per dollar) is a very important measure of demining equipment and has often been overlooked in research programs that choose instead increased sophistication.

Technologies that function well in a laboratory may not be suitable for local deminers familiar with simpler methods such as manual prodding. If operating the equipment is confusing and complex, there is every reason for a deminer to fail to trust his or her own memory of how to use it. Local humanitarian deminers may choose to ignore advanced demining tools and continue to use trusted methods. Failure to remember the correct operating instructions could result in injury or death.

Some of the effects of making demining technology choices are a lot less obvious. For example, many mine field vegetation clearance machines can only work where there is good road access and where the site is reasonably level. In many countries the flatter and more productive land, especially where there is good road access, is already owned by the richest families or the local war-lords. If mechanically assisted methods could be used to clear mines and UXO from only two-thirds of the agricultural land in a particular village a demining agency could well decide that the other third is “uneconomical” to clear.

As is well known, humanitarian demining is not one single activity, nor is it done in the same way in different countries. Far too much high technology research has focussed on finding a single universal mine detector that will have a single operating procedure—this is a military requirement more than a humanitarian demining requirement. Military mine field breaching and humanitarian land clearance by local people working for a demining organization are so different that equipment suitable for one is generally not useful for the other. Unless the results of commercial demining research are useful to the large



Khmer staff wearing personal protective equipment made at the CDW in Phnom Penh, Cambodia.  
Photo c/o Russell Gasser



and lucrative military market it is difficult to justify funding to pay for it. Humanitarian demining has been expected to benefit from spin-off from military research but this has been very limited. The cost and complexity of military equipment and the military breaching requirement for rapid detection even if small mines are occasionally overlooked are not compatible with humanitarian land clearance. Crucial decisions about humanitarian research program are taken by expert advisers who have a background in military engineering or explosive ordnance disposal. Inevitably, the equipment that is most familiar in presentation and function seems more attractive, at least initially. Hence there is a built-in bias in high-tech research towards equipment suitable for military use. Instead of humanitarian demining equipment benefiting from spending on military research the reverse has happened and the

main beneficiaries of most humanitarian high-tech demining research have been military deminers, in both their combat and peace-keeping roles.

The need for emergency demining programs will continue, but humanitarian demining is already moving toward a different role, that of being a partner in long term development. Donor funding for humanitarian demining is starting

to shrink, in the future more will have to be done with less funding and the cost-effective developmental approach will become more important. In emergency aid, the needs are acute so supplies, experts and technologies are parachuted in as fast as possible. In development, hard lessons have convinced most people that the only way to get the right answers is a sound collaboration between local people—the insiders who

really understand the local problems—and outsiders who have specific expertise. There is a wealth of experience in managing this change from emergency response to development work in such areas as health care, water supply, low-cost housing and agriculture. Humanitarian demining organizations can benefit from the hindsight of other agencies and avoid repeating some of the painful mistakes that have been made in the last 20 years. Some aspects of developmental work are already familiar to many demining organizations, for example:

- Prioritizing needs.
- Working within available funds even when they are insufficient.
- Building on existing knowledge and technologies instead of starting from scratch every time.
- Including all the people who will benefit right from the beginning so that resources are not misused.

Demining is in a leading position as many other development activities cannot start until the land is cleared, however it has similar requirements to any development work in needing the right tools and equipment. These must be:

- Functional and reliable.
- Affordable and good value.
- What the user wants and can understand.
- Suitable for local use exactly where they are needed.
- Easy to maintain and repair.

The need to develop new tools and techniques, not just select from a range of existing alternatives, imposes further restrictions. Engineering research can only be done effectively where there is access to funding, trained personnel, information, technical data, supplies of parts for building prototypes, workshops and test facilities. This inevitably means that Europe and North America dominate; the participation of professional researchers in mined countries is often underrated or ignored.

Specialized research in the richest countries has led to remarkable advances such as computers and mobile phones, but it has also narrowed the thinking of many researchers to the point where the only way forward is increased complexity. In marketing terms, more features give the user more choice. By contrast, "Advanced Simplicity," the harnessing of the latest technology and thinking to make equipment simpler has generally been ignored. In demining re-

search, finding out what deminers in the field really want has all too often become a token exercise; a good understanding of field conditions can only be gained from visiting mined areas at every opportunity. For example, the many ideas for equipment that use a color-display computer screen to warn the operator of mines are doomed to fail in some countries. Not only are these screens unreadable in bright tropical sunlight, they currently have a limited temperature range, are expensive and fragile, and mean that the deminers must focus their visual attention away from the ground and vegetation that they are clearing. Yet in the lab they seem such a good idea. What is lacking is the exchange of ideas between engineers, deminers and people who have experience of the problems of development.

Some minimum standards for any new demining tool or equipment, in addition to the more general criteria above, are that it:

- Works in the lab to humanitarian demining specifications and continues to work when taken into the field.
- Takes into account the realities of humanitarian demining SOPs and the local deminers' knowledge.
- Provides something that deminers somewhere really need and actually want to use.
- Enhances the demining process by making it faster, safer or cheaper.

There are three well-tried ways of producing more effective tools:

- 1) Design all-new tools.
- 2) Upgrade traditional or existing tools, such as improving metal detectors.
- 3) Scale down or adapt equipment from allied fields, like agricultural vegetation cutters.

Research institutes and universities in Europe have generally concentrated on the first route at great cost and with little to show. Commercial companies and NGOs have sometimes followed the second route and made good progress. Some demining organizations and specialist NGOs have taken the third route and achieved some remarkable successes.

It has become common to think that technological solutions to demining problems are difficult to achieve and require a lot of time and money. In fact the opposite is true. The record of individuals and organizations with few resources and tiny budgets making major improvements is quite outstanding.

Successful vegetation clearance and building-rubble-clearance equipment has been built by demining organizations for their own use from commercial off-the-shelf components; visors and protective clothing are now made in several countries by local workshops and metal detectors are now better than a few years ago. In parallel, improved management and refined SOPs have led to a large increase in deminer efficiency and a reduction in accident rates.

If we persist in spending vast sums of money tackling the wrong problems (e.g. detecting buried



mines in level lawns), if we look only to technical experts with very narrow specializations and if we ignore any development issues, then we can expect another few years of fruitless effort and wasted money. The choice is clear. ■

*\*Opinions expressed are personal and not necessarily the views of the DTU of the University of Warwick.*

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*Field testing a force-feedback prodder designed as a training aid. The prodder indicates when excess force is used during prodding/excavation.*

*Photo c/o Russell Gasser*

*Manufacturing Tempest vegetation clearance machines. Hulls being made in Cambodia. Final assembly in Britain.*

*Photo c/o Russell Gasser*

# Strategic Management for Mine Action Operations:

## A Case for Government-Industry Partnering

by Dr. Alan Childress and Lieutenant Colonel Pete Owen

### Summary

Directed mainly at policy makers and leaders in mine-plagued nations and government and non-government mine action planners, the article argues for holistic mine action strategies, coordinated priorities, and best management practices. The authors establish the need for nations to take charge of their mine action organizations and present strategic management methodology to implement self-determination concepts. They insist that humanitarian demining must start with the end in mind, an integrated and nationally prioritized requirements analysis of each of the mine action areas—mine awareness, mine field assessment and surveys, mine and UXO clearance, victim assistance and information management. They also suggest that nations should consider reconstruction and development programs, as well as mine action, when contemplating resource mobilization. With nationally prioritized programs, and mine action centers managed by host nation-dedicated general managers, nation's can expect to achieve optimum resource allocation and, most importantly, to look after their people as a first priority. The author's recommend that nations look to industry for dedicated, first tier mine action program managers.

### 1. Introduction

By way of introduction we relate Andy Smith's description of the beginning of a typical humanitarian demining effort. At present, Smith writes in the October 1998 *Journal of Humanitarian Demining*, humanitarian demining in most affected areas begins with a U.N.-led emergency response, which is controlled by ex-pats, who usually have a military background and who are largely paid for by 'ear-marked' donations

from U.N. countries. At the same time, as the U.N. arrives, the specialist charitably-funded clearance groups, which are funded by an individual government's aid budget or by trusts and donor charities, tend to move into the area. Following the charitable groups come the commercial companies, some of them regionally based, while others may appear regionally based but are actually initiated by profit-taking outsiders. Further, while a few new charitably funded demining groups still exist, most of the new players are commercial companies. For example, with the massive funding available for work in the former Yugoslavia, European groups are anxious to get involved and new allegiances and companies arise weekly.

Our point in relating Smith's scenario is to highlight the apparent lack of holistic strategic planning and management processes that would help coordinate and manage scarce humanitarian demining resources. While planners and resource suppliers have increased dramatically since the early-90s, we find no apparent corresponding management strategies to coordinate those planners' and suppliers' intentions. Humanitarian demining documents suggest that governments, non-governmental organizations (NGOs), and other donor organizations have entered the demining equation without an integrating plan to help synergize their donated resources and have become immune to the cry for help. Our experience in humanitarian demining, combined with our research of the humanitarian demining management and technology literature, reveals that the humanitarian demining industry's customers, the 70 or so mine-plagued nations, would benefit greatly from a general model, a process, to strategically manage their humanitarian demining efforts. In general, our paper is addressed to the leaders of those mine-infested na-

tions, calling on them to establish clear priorities in relation to the needs of their affected people and to manage the accomplishment of those priorities with the most sophisticated management practices they can summon.

### 2. Literature Review

According to several humanitarian-demining sources, landmine clearance will require decades of organized, deliberate, and time-consuming effort. Studies reveal that 60-100 million landmines lay abandoned in at least 70 countries around the world and landmines are responsible for killing or maiming an estimated 500 people each week. *Hidden Killers 1998: The Global Landmine Crisis* reports the cost to remove one landmine averages from \$300 to \$1,000 and the cost for surgical care and fitting of an artificial limb is \$3,000 or more per amputee in some countries. An additional problem, *Hidden Killers 1998* continues, is the long-term effect on people and their environment. Landmines stand in the way of efforts to restore war-torn societies to normal life. They consume billions of dollars of assistance that could be used to bring prosperity and reconciliation, impacting virtually every aspect of life in the mine-affected countries and on the international community as it seeks effective ways to help those countries. *Hidden Killers 1998* concludes, in part, that the landmine crises can be successfully overcome, if the countries suffering mine pollution are determined to tackle the problem, and if the international community *can sustain and coordinate its investment* (italics ours) in eradicating the landmine plague.

In addition to *Hidden Killers 1998*, we found several writers who stress the need for a comprehensive management approach to mine action operations. We briefly cite the

more adamant writers below. Note that we replace humanitarian demining with mine action, which refers to all those activities that address the problems faced by populations as a result of landmine pollution.

Retired Ambassador Robert Oakley et al., arguing in a Los Angeles Times article that international demining planners need to develop a comprehensive demining strategy, suggest that the international community must begin working together now to develop an integrated approach to humanitarian demining. They assert that all components of mine action—mine awareness, mine assessment and survey, mine and UXO clearance, and victim assistance—should be integral parts of any comprehensive international demining operation, stating that these initial steps were not taken in Bosnia. International companies, local contractors and local forces tackled the larger Bosnian mine problem and they are still at work today, competing for funding and influencing priorities. Oakley et al. claim this lack of a comprehensive master plan has exacted a high price—human suffering remains, and economic output is still less than half its 1990 figure.

They further claim, regarding Kosovo, that despite the widespread belief that mine clearance is an integral part of post-conflict peace-building, economic revitalization and sustainable development, there is no agreed model for addressing or even coordinating these different needs and roles. They conclude that to be effective, international mine action planners must develop a comprehensive strategy now. Otherwise, the "fighting may cease, but the casualties will go on and on." We agree with Oakley, suggesting in our Implications and Conclusions section that the World Bank, U.N., donor nation and NGO endeavors might be consolidated under a Development Action Center, synthesizing their resources to national interests.

According to David Ahern in a *Journal of Humanitarian Demining* article, the U.N. has assumed the lead in coordinating NGO demining efforts with those of their own forces, and that one of their principles is that primary responsibility for mine action plans

rests with individual states. When the state is inherently incapable of demining its land this ability must be developed, in which case the U.N. assumes the responsibility of capacity building. Reviewing U.N. landmine policy documents, we find the United Nations Mine Action Service (UNMAS) is indeed the focal point within the U.N. system for all mine-related activities, responsible for ensuring an effective, proactive and coordinated U.N. response to landmine contamination. UNMAS is tasked with helping to facilitate global efforts at coordinating mine action. Mine action strategic management at the country level, however, does not appear an UNMAS function, although country-level mine action strategic management could be inferred from UNMAS' holistic goals.

Joe Lokey, arguing for comparative advantage economies, suggests that matching needs and resources and creating public-private relationships is of paramount importance. He writes in the *Journal of Humanitarian Demining* that the challenging dynamic of the last three to five years is that with more resources becoming available, the challenge has become more complex and difficult to manage. Few organizations and activities have much experience managing and executing mine action programs on the scale now necessary. Lokey submits that the U.N. has had a comprehensive role in attempting to orchestrate global demining and related activities. Mine action center management is frequently U.N.-sourced, although their mine action center management role has been limited by reorganizations within the U.N. demining offices, resource realignments, lack of consensus by the demining community on the role of the U.N., demining funds debates, etc.

Another need for widely accepted and applied best management practices, according to Lokey, is based on the potential of governments, NGOs, and other relief agencies to become overly dependent on their internal bureaucracies when implementing their mine action policies. Mine action priorities are generally different among governmental agencies and organizations. Bureaucracies, sometimes called "stovepipes," un-

dermine the importance of teaming and process building or improvement and thwart interagency coordination and cooperation. The almost insidious, ever present "hidden agenda" must be acknowledged as underlying many mine action discussions and evaluations.

Perhaps Lokey's most important point, relevant to our argument for centralized strategic management, is that donors and other resourcing agencies must recognize the authority of the host nation or their designated representatives. Too frequently, developmental activities take on a paternal characteristic that minimizes the role of the host nation and reduces their input into decision making. We suggest later in the article how host nations can achieve a mine action upper hand through indigenous, strategic management competencies, led by a professional general manager.

In the *Wintergreen Conference Proceedings* Henry Thompson discusses donor influence on safety and productivity in humanitarian demining, based on Bosnia and Herzegovina scenarios. He presents a model that involves donors early on in the mine actions processes and ties them to safety and productivity aspects throughout the mine action stages. While humanitarian demining is donor-driven at the macro level, he concludes, at the micro level donors have not been adequately accountable for the efficiency or safety of their programs. We agree with Thompson that donors should play a key role in humanitarian demining and they should be more active. We're concerned, however, that the host nation must be equally involved in planning from the beginning in forming and implementing its humanitarian demining strategy. He also addresses the notion that demining should be approached under the overall economic and social development context, a provision we strongly concur with.

Major Colin King, in a *Journal of Humanitarian Demining* article, suggests we study requirements before investing in technology. Supporting Lokey's argument for host nation participation in the mine action planning process, he argues that there is inadequate communications between the op-

erational and scientific communities, and that optimizing the process of demining requires much more than the development and incorporation of high technology. It involves a logical and coherent approach to well-defined aims.

Two other professionals we consulted are Donald "Pat" Patierno, Director, Office of Humanitarian Demining Programs, U.S. Department of State, and Wolfgang Schussel, the Austria Vice Chancellor and Foreign Minister. Patierno, arguing the U.S. case, strongly believes that the host nation's demining authority, if it exists, must take responsibility for the management of demining programs so that mine action activities provide the greatest benefit to the host nation. An established mine action center should clarify its nation's policies; enforce demining safety standards; and provide quality assurance measures. In addition, an established mine action center would coordinate NGO and international organizations' efforts, helping to avoid duplication, reduce waste, save time and most importantly, save lives. Speaking for Austria, Schussel amplifies Patierno, advising that mine action programs must be of a comprehensive nature, even to the point that they must be seen as integral parts of comprehensive reconstruction and development programs. We note that this latter point is also a position of the World Bank, which we discuss in our closing section.

In addition, a strategic management process would help produce cost-benefit analyses, generally needed for nations seeking demining financing. According to the World Bank's policy document on *Mine Action Programmes*, the high cost of financing land mine clearance activities should also be justified on economic grounds, taking into account the scarcity of financial resources. In this regard they note a significant aspect of mine action which needs attention is the integration of mine pollution information into the process of planning for other sectors in development and reconstruction. Mine pollution affects the comparative expense and value of differing strategies for repair of roads and infrastructure, rehabilitating agricultural production and

other areas of reconstruction. Because demining money and development and reconstruction money have often been compartmentalized, trade-offs are not uniformly made. National leaders, in our view, should be able to examine all assistance initiatives concurrently and openly, helping prioritize their nation's crises from a well-informed knowledge base.

One other point we would make: Can the existing international political and donor level of awareness be maintained? Patierno (in a 1999 comment in a State Department road show soliciting private money for humanitarian demining purposes) warns that donor fatigue at some point is going to set in among donor nations. We need to conserve and distribute mine action resources for the long term, anticipating that public and private sector focus, awareness, and vigilance may wane over time. Nurturing the humanitarian demining constituency over the long term may be less complicated if mine infested nations can present centralized, responsible, well managed mine action centers that report incremental progress on a consistent basis.

Finally, we note a current appalling situation that amplifies our plea for holistic strategic management. James East reports that mine-infested Thailand signed the Ottawa Agreement, compelling the Thai military to earnestly start mine removal on the Thai-Cambodian border. However, the agency set up to do it, the Thai Mine Action Centre, has not yet started conducting surveys to determine where the mines are. East quotes the Centre's frustrated assistant director, "we have been here for a year and we have not yet removed one mine" even though U.S. military experts trained the Thais in mine action when the Centre was established. The Centre's 150-person staff awaits HK\$20.1 million budget approval from the Defense Ministry. The 99 trained deminers are "twiddling their thumbs in their barracks," according to East, despite American pledges to help in financing mine detecting dogs, mine detectors and armored vehicles. This indicates that while U.S. training was successful, retraining may be necessary soon (demining skills tend to

wane if not used) due to the Mine Action Centre's lack of an integrated or holistic approach to their mine problems.

### 3. The Mine Action Strategic Management Process Defined

Strategic management, in our context, expresses a commitment to identifying, prioritizing, and implementing the optimum mix of available mine action resources for a given mine-plagued nation. The key to strategic management, which is a process, is recognizing that the resource equation to address mine problems will most likely differ from one mine-infested geographic or political area to another. That is, mine action resource mixes, not constant, must be tailored to the environment and an evaluation of the host nations' ability to sustain a long-term commitment.

Our strategic management process starts with the end in mind—a host nation-led, U.N. or NGO-supported Requirements Analysis of the mine-infested environment—then works back examining all resources available to help achieve the host nation's mine action goals, *irrespective of mine action agendas not indigenous to the host nation*.

The first part of strategic management focuses on a clear understanding of the host nation's vision, goals and objectives and an understanding of what other donors will bring to the table. The host nation, in developing its strategic plan with the help of the lead donor, selects the optimum mix of available mine action resources based on a requirements analysis of the mined environment. All components of mine action—mine awareness, mine field assessment and surveys, mine and UXO clearance, victim assistance, and information management—must be examined in the requirements analysis and reflected in the resource mix. The resource mix (requirements) selected for employment is based on host nation goals and objectives, and written into their strategic plan that details the support they require from donors.

The second part of the strategic management process is implementing the strategic plan (the resource mix), through a cy-

clical process of planning, organizing, resourcing, controlling and sustaining the mine action program. It's not enough to develop the optimum resource mix. To fully exploit it, host nations must effectively and efficiently manage the application of those resources, through a national mine action center, to achieve their mine action visions. We believe that obtaining or developing an independent, host nation-dedicated, sophisticated general manager to manage the mine action center for the long term is as important as developing the strategic plan. Indeed, it is part of it and we will address this challenge in our conclusions.

### 4. Strategic Management Process Applied

In this section we discuss our two-part model, the strategic planning phase followed by the implementing management cycle.

#### Strategic Planning Phase

We suggest host nations start by studying the contaminated areas concurrently with establishing a mine action center organization. Typical questions that might be asked during the strategic planning phase are: Has a National Level One Survey been considered? What types of mines are present or suspected? Casualty data? What is the soil content? The foliage? The culture of the people in the mine polluted region? What is the land used for? Urgency of mine clearance? Economic implications? Political considerations like can the nation sustain mine action and is the government able to support long a long-term commitment? What type of equipment is employed and what is its condition?

Relative to the mine action organization, will the military and civilian sectors cooperate, with the civilian sector leading the policy decisions and the military implementing? This is generally a condition for U.N., World Bank, and NGO support. What is the structure of their existing humanitarian demining organization? What is their demining experience?

Seeking an optimum resource mix for the country, the host nation should build a requirements matrix for each of the five

components of mine action—minefield analysis and survey, mine awareness, mine and UXO clearance, victim assistance, and information management—for each mine-infested region, then aggregate the data in a national matrix. The matrix, based on a Level 1 survey if available, will help the host nation decide their approach to each mine-infested region.

#### Management Model

Our thesis is that mine-plagued nations can and must manage all aspects of their mine action challenges—mine awareness, minefield assessment and surveys, mine and UXO clearance, victim assistance, and information management—by coordinating and cooperating with donors and other players in the demining industry. Only in this manner can they synthesize and synergize human, material, and funding resources to achieve timely and effective solutions to mine threats. While not advocating a one size fits all management plan, we challenge mine action planners to apply best management practices to achieve the optimum use of scarce resources. We suggest a 6-part management cycle, which we tailored to help mine action leaders establish a mine action management process. The cycle involves planning, organizing, resourcing, controlling, and sustaining, all wired together by coordination (Figure 1). We rely on UNMAS for mine action organization terminology and standards.

#### Plan

Planning implements the strategy discussed above and starts with the general manager or minister-in-charge determining the goals (or targets) that must be achieved to reach the national leader's mine-free vision. Following goal establishment is defining measurable objectives necessary to achieve those goals. The general manager may next want to establish and schedule the activities necessary to accomplish the objectives. The planning process actually starts while performing the Requirements Analysis that indicates the resources needed to accomplish the mine action goals. The Requirements Analysis document (we recommend the matrix form) is the guide used to plan and schedule the objectives and events

leading to goal accomplishment.

For example at our organization, U.S. Central Command, when we enter a nation that has sought U.S. mine action assistance, the planning matrix (similar to a schedule) we use is designed to help stand up the new organization and teach the host nation how to manage their humanitarian demining operations. The matrix we construct is relatively simple, listing the activities required to stand-up the organization on the left side and dates across the top (usually in months). Then we start filling in what should be done and by whom. This approach works best with new start programs. (Once the host nation has the MAC and humanitarian demining committee operational, we work to support their goals and assist them with resolving their most significant problems through a train-the-trainer process and donated material and equipment.)

Two significant U.S.-led events occur during the Planning phase that might also serve as examples. Following the Department of State Policy Assessment Visit, which determines U.S. involvement in a nation's request for demining assistance, we begin developing the U.S. Humanitarian Demining Country Plan. This plan, which we draft in continuous coordination with the host nation, mine action trainers, et al., serves as our resourcing strategy.

It is written to accurately capture all resources and direct them toward the required support of the host nation. This plan, which helps eliminate redundancy, identifies high-demand military training assets, and helps coordinate the myriad activities carried out by different U.S. organizations. It defines the host nation's mine problems and requirements as well as the U.S. commitment. We suggest Mine Action Center (MAC) general manager's develop a similar resourcing holistic plan, in particular to depict resource requirements of their country, for budgeting purposes of NGOs and other donors.

#### Organize

Developing the organization to establish and support the mine action center and humanitarian demining committee organizations will largely determine successful ex-

ecution of the plan. How do we arrange our human resources to best accomplish the objectives we set out while planning? Also, defining processes is extremely important—how does work get done at the national MAC and regional MACs? Among donors within the MAC?

We recognize many aspects of “organizing.” The host nation establishes their national humanitarian demining Committee, national MAC, and regional MACs. The donors and donor committee organize donor support to best address host nation requirements, problems and needs and the U.S. organizes its support to provide its part of the required support. In our case we write and coordinate our Country Plan and ensure that our planned support compliments and synergizes the host nation assets and donor support to the host nation. If a military-only organization exists, we will recommend some sort of a civilian-led, military implemented hybrid organization that all donors can support.

If some sort of donor organization is not in place, we attempt to organize one to facilitate future support and to better coordinate efforts. Part of our Requirements Determination Site Survey (actually a requirements analysis) is designed to determine who is doing what in the host nation, who has the lead, and where the U.S. fits in the big picture (our aim is a viable self-sufficient program.) This also includes helping organize donor support to the host nation.

**Resource**

Resourcing provides funding and personnel to support the MAC and RMACs and should be coordinated while developing a Country Plan. Based on the Requirements Analysis, all aspects of the mine action program must be considered in the resource plan, providing donor organizations not already part of the nation’s demining plans an opportunity to fill in needed funding or resource gaps.

At U.S. Central Command, we start resource planning in earnest during the Requirements Determination Site Survey while we’re conferring with the host nation and NGOs interested in helping the host nation. We then draft the U.S. Country

Plan, staff it with all interested agencies including the host nation, then brief the coordinated draft plan to host nation representatives, U.S. humanitarian demining program managers and force providers (trainers) for approval. The briefing is conducted at what is called a Resource Allocation Planning Meeting. The end result is a resourcing plan (the Country Plan) that is, again, technically approved by the multiple humanitarian demining organizations and the host nation (although not yet signed). The agreed upon plan is then signed by the U.S. Ambassador to the host nation and sent to the decision authority within the U.S. government to provide resources. U.S. resources are approved through the Inter-agency Working Group, which represents upper-level decision-makers from several U.S. Government agencies. In the event that approved resources are less than required, the plan is reworked to account for shortages and coordinated once more with all involved agencies supporting humanitarian demining, including especially the host nation, to help eliminate shortfalls.

**Control**

We would caution general managers regarding establishing control measures for demining operations. Evidence suggests that control systems produce two kinds of invalid data: invalid data about what can be done and invalid data about what has been done. Military deminers, perhaps unsophisticated in the role of accurate data, may wish to please their organizations more than reporting data accurately. Quality Assurance management (systemic quality) should be practiced through rigorous demining training and strictly enforced safety practices. Quality Assurance, in addition to Measures of Effectiveness, are techniques we would recommend host nations establish for controlling quality and reporting progress, thus helping ensure effective and consistent U.S. and other donor support. Regarding the importance of reporting progress, we reiterate here the necessity of Mine Action Centers reporting incremental progress on a consistent basis.

In general, the U.S. does not attempt to control the host nation mine action pro-

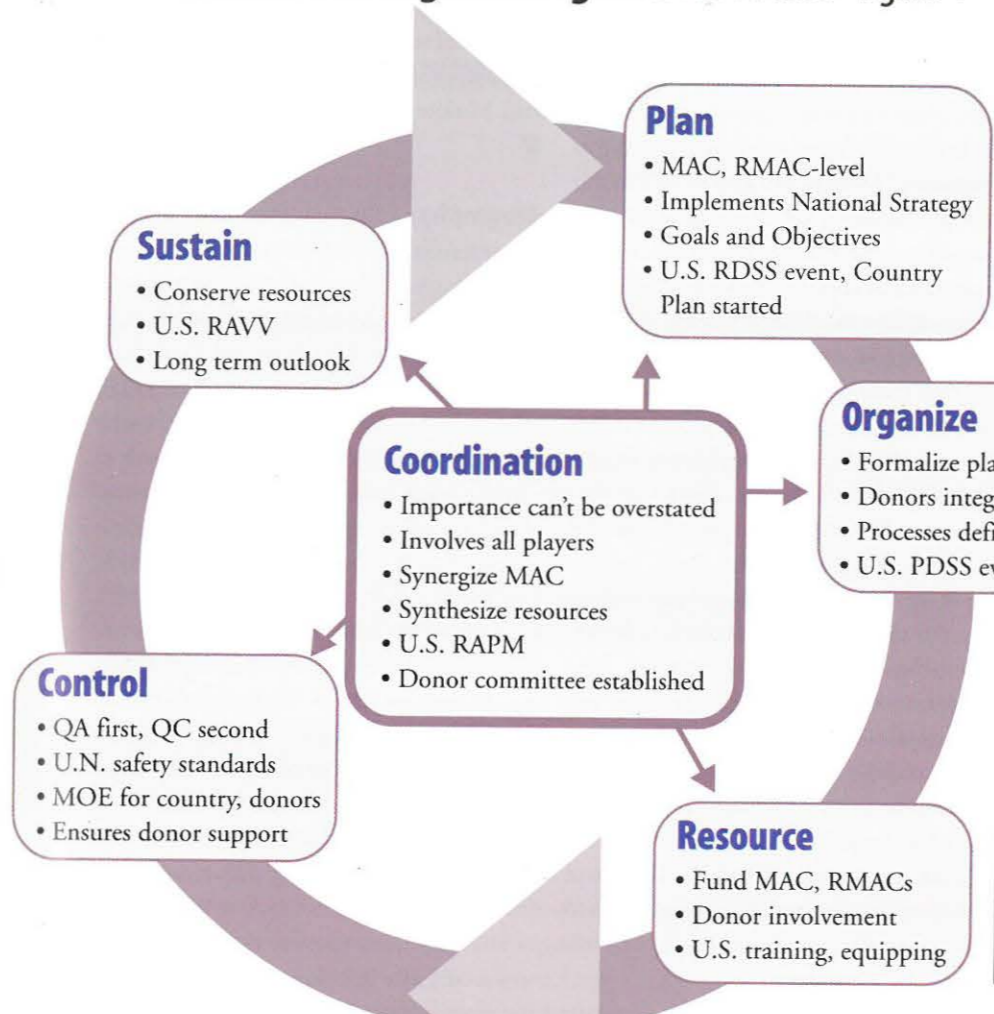
gram. Accounting procedures are established and cover everything from accounting for equipment to the quality of the instruction being conducted in any of the elements of mine action. Measures of Effectiveness (MOEs) are established for measuring two things – how well the host nation is conducting humanitarian demining and how well the U.S. support is assisting the host nation. These MOEs are often different from the host nation’s or other donor’s Measures of Effectiveness. The general manager must gather the appropriate information to assess MOEs and adjust his program as necessary to sustain and improve U.S. and other donor support.

**Sustain**

We repeat Patierno’s warning that donor fatigue at some point is going to set in among donor nations. General manager’s need to conserve and distribute mine action resources for the long term, anticipating that public and private sector focus, awareness, and vigilance may wane over time.

In this phase, the U.S. focus changes from intensive, daily support of the new organization to maintaining, consulting and looking more long term for new technologies and techniques that might help speed efficiency and improve safety for the host nation. Our presence is scaled back to 30-45 days per quarter, usually focused on specific elements of mine action such as mine awareness. For example, our mine action assistance program consists of a formal annual visit called the Requirements and Verification Visit specifically designed to review and update the host nation’s humanitarian demining requirements, what the other donors are doing, and then verifying that equipment previously donated is being used properly and effectively. Obviously, we spend considerable time in the host nation throughout the year but the Requirements Analysis Verification Visit is conducted to work with the highest levels of the host nation government and to ensure the host nation understands we hold them responsible for the supplies and equipment provided. The results of the Requirements Analysis Verification Visit are then used to update the Country Plan, changing or

**Mine Action Strategic Management Process figure 1**



**Figure 1**

- RDSS is Requirements Determination Site Survey
- PDSS is Pre-deployment Site Survey
- RAPM is Resource Allocation Planning Meeting
- RAVV is Requirements and Verification Visit

modifying U.S. support to the host nation in light of the status of their goals and objectives as well as what other donors intend to provide. Our Country Plans cover two years and are coordinated with all agencies associated with humanitarian demining in the host nation (including the host nation). U.S. Country Plans are posted on the web at www.centcom.mil.

**Coordination**

In our view, coordination in mine action is continuously communicating within and among all players associated with the host nation’s mine action program, to include players who may have a contribution but are unaware of it. Reinforcing the holistic approach, coordination starts from day one and never stops—it is the key to efficiency and success. Coordination brings the players to the table to achieve the host

nation’s demining vision and helps break down bureaucratic “stovepipes.” Coordination is central to the five management steps discussed above. In situations where there are competing desires and agendas between donors and the host nation, vigorous and open coordination is absolutely critical.

In our program, the establishment of a formal donor committee and good lines of communication with the host nation is essential. The donor committee must be chaired by an organization that can help ensure all donations support the host nation with minimal redundancy or waste. The donor committee provides the forum for coordinating donor plans and de-conflicting resource arguments. Coordination is the key to success! Managing coordination within the MAC—indeed, achieving a degree of cooperation among the mine action func-

tions—may be the general managers’ greatest challenge.

**5. Conclusions and Implications**

a. While we suggest that strategic planning for mine action is distinct from management planning, in practice management leaders generally combine the functions—thus, the Strategy would be developed in the Planning phase of the management cycle. We made the distinction to emphasize the importance of determining a country’s total mine action requirements before contemplating resources, which most countries tend not to do. Our Strategic Management logic would also apply to countries that decide to outsource their mine action operations. Host nations should lead the Requirements Analysis phase and provide a general manager to lead their Mine Action Centers. Host nations would do well to advertise their general management needs to international management consultant firms. The investment

in an exceptional general manager, beholden only to the host nation government, should achieve significant returns on the investment, in terms of humanitarian and resource allocation outcomes.

b. The implications of well planned and host nation-managed mine action programs are considerable, including serving the host nations’ political, economic, as well as mine action agendas. Arnold Sierra, a Foreign Service Officer currently engaged at the U.S. State Department’s Humanitarian Demining Program, suggests that host nation’s consider an umbrella Development Action Center (DAC), which would integrate mine action and national development and reconstruction activities, supporting self-determination goals. A donor support methodology could be established within the DAC to help eliminate waste, synergize donor support, and coordinate activities by

the many different donor agencies involved. We note that as a development agency the World Bank supports member country programs that help lead to the eradication of poverty and to the promotion of sustainable development. Its support of mine action is based upon the recognition that mine pollution is, for many affected countries, a significant obstacle to the reestablishment of normal development activities. In this context, it shares with UNDP a perspective which views mine pollution as a development problem with long term consequences and, necessarily, with long-term solutions which extend far beyond initial humanitarian concerns. Also important is that the Bank shares responsibility with UNDP for convening donor groups in reconstruction situations and thus has a major role in resource mobilization and in setting long term agendas for international support for mine action and other needs. Similar to UNDP mine action policies, land mine clearance in Bank-financed projects must be carried out under the auspices of civilian authorities, an incentive for civilian-led national Mine Action Committees, setting policy for Mine Action Centers.

c. Implications for continuous Quality Assurance, not necessarily Quality Control, are significant. While Quality Control at the demining unit level is necessary and important, Quality Assurance, systemically managed by the general manager, is equally important. Assuring that training and safety systems are well designed, properly taught and rigorously enforced is a function of the

general manager, not off-handedly delegated to subordinates. In addition, it is the responsibility of the general manager to establish Measures of Effectiveness for his Mine Action Center, which tell his boss or the Prime Minister how the mine action program is progressing. Donors will also need data for their own agendas, which the general manager must accommodate if he expects continuous donor support. Having established its own Measures of Effectiveness, the U.S. will assist general manager's in establishing data collection methods to meet their (and other donors') data needs. The point is that general managers need to realize the importance of regularly reporting mine action data to donors, helping ensure their long-term support.

d. As we suggest throughout this article, our research and experience indicates that worldwide mine action remains fragmented and uncoordinated. Holistic national approaches to their mine action problems would appear to help sustain stable and generous donor support. Regarding competition for demining resources, holistic approaches may tend to prioritize donor support to regions enduring the most human suffering, rather than those with the most political influence.

### **An Application of Strategic Management and Lessons Learned**

In the June edition of *Journal of Mine Action* the authors will demonstrate their strategy and management model through a fictional nation that contains many of the

mine action problems in existence today. They will also present an organizational model and several of the lessons they learned during their experience in Horn of Africa and Middle East mine afflicted countries. ■

### **Biography**

Lieutenant Colonel Pete Owen, USA, is the Program Manager for U.S. Central Command's humanitarian demining program. He is responsible for all U.S. mine action operations in the Middle East and in African nations that comprise Central Command's area of responsibility. Much of this article is based on lessons he learned while establishing and managing the program.

Dr. Alan Childress, a management consultant for Booz-Allen & Hamilton, is currently engaged as U.S. Central Command's humanitarian demining Country Manager for Ethiopia, Eritrea and Djibouti. He specialized in international management while earning his business administration doctorate at Nova Southeastern University.

The authors acknowledge the contributions of John Johnson, the U.S. Central Command's humanitarian demining Country Manager for Jordan, Egypt, Afghanistan and Oman. His extensive mine action knowledge and his compassion for people affected by the worldwide landmine affliction are unparalleled.

## **EUDEM:**

### **The European Union in Humanitarian Demining**

*continued from page 7*

destructive testing, signal/image processing, remote sensing, Geographic Information Systems and medical imaging.

#### *Existing vs. new technologies*

Several national demining campaign sponsors brought up that less emphasis should be put on development of new technologies. The "improvement of existing technology will resolve the problem faster." Some prefer an imperfect technique whose limitations are well-known as compared to a new technique that is not yet trusted. The need for complete solutions, taking into account all aspects was stressed by many NGOs – Mine Action is indeed not only about demining.

#### *(Global) R&D trends*

Much of the R&D effort for humanitarian demining has gone toward the detection of individual mines. Two approaches seem to be the most predominant: the use of a multi-sensor system, or the combination of a detection sensor. Some research is currently done on wide-area confirmation methods. Airborne mine field delineation or explosive vapor/trace detection to complement—or partially replace—dogs, in order to save precious time by concentrating on areas which really need to be demined. Evolution should be governed by a set of keywords (NPA): "Safer, Faster and Cheaper."

#### *Sensor technology maturity*

Consider: we have to rely on indirect evidence due to the absence of well-established definitions of equipment performance; most of the results of independent performance tests are not publicly available; we have not conducted performance tests ourselves; and we do not share the practical experience of deminers working in the field. We nevertheless think that Table 2 is useful in fixing the large tendencies in technology maturity and equipment cost.

#### *Airborne mine field detection/remote sensing*

The role of remote sensing vs. ground-based methods has not yet been fully identified. For airborne mine-field detection on realistic surfaces (100- to 1000-km<sup>2</sup>), terabytes (1000 gigabytes) of digital data have to be analyzed. Setting-up a measurement campaign is a complex and expensive operation. Although for civilian applications on-board processing

might not be a primary requirement, even off-line analysis requires huge computing facilities. The development of remote sensing systems has been primarily done in the military context and it is unlikely that these systems will be operational for civilian applications in the near future. Several platforms have been tested, like airships, aircrafts, drones and helicopters. The privileged sensors are the optical and the IR imager, although UWB-SAR seems to yield promising results for the future. On certain soil types and non-densely vegetated areas the airborne mine field delineation results are reported to be successful (e.g. deserts).

#### *Testing and evaluation*

The implementation of specifications for testing protocols is again an international mission. The existence of several ad hoc protocols is a well-known fact after this survey, but they remain proprietary information, which is inaccessible for the research community. In order to test or compare new technologies that are in the development phase or have been developed, a possibility should exist to gain confidence by application in the field. The establishment of a joint working group, focusing on the development of testing methodologies and the design of standards for sensor and system assessment, is currently ongoing. On the European side, the existing Committee of Advisors: Detection of Mines based on Operational Standards (CADMOS) workgroup, promoted by JRC, acts as the core group.

EUDEM started in December 1998 and ended in July 1999. The survey was conducted by EPFL (École Polytechnique Fédérale de Lausanne) and VUB (Vrije Universiteit Brussel). It was funded by EU; DG XIII. ■

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# AZERBAIJAN



**HISTORY:** Azerbaijan declared independence from Russia in 1918, but was incorporated in the Soviet Union in 1920. It again declared independence in August 1991, following the collapse of the USSR. The conflict between Azerbaijan and Armenia over the Nagorno-Karabakh region is still unresolved after 10 years and Baku has yet to settle disputes with its neighbors over oil rights in the Caspian Sea. During 1988–1994, Karabakh Armenians declared independence and seized almost 20 percent of the country's territory, creating an estimated 750,000 Azerbaijani refugees. As a result of the war, western Azerbaijan is plagued with landmines. Both sides have generally observed a Russian-mediated cease-fire since May 1994. Azerbaijan, with an estimated population of 8,000,000, adopted a new constitution in November 1995.

**LANDMINE AND UXO OVERVIEW:** The disputed territory of Nagorno-Karabakh, torn by five years of war between Armenia and Azerbaijan, has a serious mine problem. Mines affect farm work all throughout the region. The United Nations and the U.S. State Department estimate the number of mines to be 100,000. Considering the population density, the land area and the number of mines, the degree of infestation is close to that in Afghanistan. In Martakert, 78 miles of mined roads and 31 sq. miles of mine fields have been identified. Both AT and AP mines have been found.

**VICTIMS AND CASUALTIES:** According to official reports 7,000 people have been injured in the conflict with 70 percent resulting from



landmines. The Ministry of Labor has allowed the ICRC to inhabit a building in Baku for prosthesis production. Rehabilitation and psychosocial programs are nonexistent.

**DEMINEING:** The national Agency for Rehabilitation and Reconstruction of Areas (ARRA) estimated it would cost 5.2 million dollars to demine 22 villages in the Fizuli region. Norway contributed 134,000 dollars in 1998. HALO Trust has trained six supervisors and 45 deminers from the local population. To date, HALO has destroyed four tons of UXO and has started mine awareness through the media. Demining by self-defense units would help increase arable land area by 20 percent.

**WAR REALITY CHECK:** The landmine problem was evident in the summer of 1994, when a lull in fighting allowed time for the harvest. At least 10 people were killed and many more injured by exploding mines while working in the fields, reported the Tass News Agency.

**CONTACT INFORMATION:** Azerbaijan National Agency for Demining (ANAD)

# PROFILES

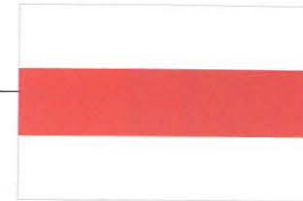
Eastern Europe & the Caucasus

## BELARUS

**HISTORY:** Belarus has had a long and devastating history that intertwines them with several different countries. The country has been filled with war and strife as far back as records can date. During the 19<sup>th</sup> and 20<sup>th</sup> centuries, Belarus was plagued with the Germans and Russians fighting in World War I, and they were severely plundered during World War II by many different foreigners. In 1918, the area now known as Belarus became a part of Russia after the Russo-German treaty, which helped end World War I. Despite the tight grip that Russia held on most of its republics, it allowed Belarus to establish individual ties with the United Nations. In 1991, after the USSR dissolved, Belarus claimed its independence and the republic's Communist party (CPB) appeared to take over. For the next few years the idea of a constitution and new leadership filled the country's atmosphere. Belarus has remained the closest country to Russia in hopes of becoming a member of the international community and has, within the last year, signed a treaty with Russia, which states that each country, Russia and Belarus, will work for greater agreement politically, economically and socially.

**LANDMINE AND UXO OVERVIEW:** Belarus has been plagued with war, landmines and UXO all throughout its borders. The most predominant areas are the battlefields from World War I and II. The cities and provinces closest to these grounds are

# BELARUS



Gomel, Minsk, the capital, and the most heavily mined area, Vitebsk. Many of the officials in Belarus are trying to educate the people and show them the proper way to handle a mine if encountered and more importantly, what *not* to do. Two non-governmental organizations, the Belarus Support Center for Associations and Foundations (SCAF), and the Belarus Campaign to Ban Landmines (BCBL), are working with the Belarussian government to help promote safety and build solid support centers for the victims of landmines. SCAF, established in 1996, strives to develop the culture and society of Belarus by supporting other NGO initiatives such as the BCBL. Founded in 1998, BCBL supports the public education of all locals on how to deal with landmines and UXO when discovered. Despite government help and education, it is speculated that Belarus may make landmines and place them within their own boundaries as well as ship them elsewhere. Against this charge, the Ministry of Defense stated that Belarus had neither produced nor ever will produce any type of landmine.

**VICTIMS AND CASUALTIES:** Bela-russian victims can be categorized into three groups to best assess the damage done to their culture. The three categories are:

- Civilians affected *during* World War II as children (Gomel 1941-1945)
  - Civilians affected by UXOs *left after* World War II
  - Former military personnel during the Afghanistan war in the 1980s
- These three groups can summarize the devastation and pain that Belarus has



had to face over the past century. Even though much of the country is rural, there are several hospitals that can help with the basic medical needs of the locals. There are simple hospitals to care for minor injuries, but there are also some prosthetic and rehabilitation centers that format special individual programs for individual patients. This concept helps not only the landmine victims, but their families and communities also. The overall perception of landmine victims and their assistance to try to be as helpful as possible and to protect them. The government has also established rules that allow the disabled to maintain their jobs with pay even while being absent. This attitude helps to establish a better relationship between the Belarussian government and its people.

**DEMINEING:** There is no national program of destroying landmines except through the military, the Department of Engineer Forces in Main Headquarters of the Belarus Military Forces, which formed over 44 groups to separate and look carefully for mines. Once discovered, the mines are either disposed of on-site or taken to a safe

location and destroyed. Reports show that from 1991-1997 over 120,000 UXO and 1,000 AP mines were destroyed in the area of just 300 kilometers (\$12,000 per kilometer). In 1996, over 10,700 UXO were destroyed at a cost of \$100,000. A lack of funds has left many landmines uncleared and left many more people in danger. All of the land that has been cleared have benefited the locals who use it for agricultural purposes.

**WAR REALITY CHECK:** There have been many people maimed or killed as a result of these undiscovered landmines, and the horror stories of the victims and their families' pain touches the hearts of many who have listened to each individual story and understood the unfairness. The story of Alexey Dralov and Alexey Toliadonok swept throughout Belarus in 1998. Two teenage girls, both age 17, were killed by a UXO while walking near a railway station in Krugleuschina, the Dokshitshi district. Vitebsk is one of the most heavily mined areas and even though most of the landmines are usually placed in rural fields, in which few travelers pass. There is still a threat to farmers and civilians even today.

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# PROFILES

Eastern Europe & the Caucasus

## BOSNIA & HERZEGOVINA



**HISTORY:** After Marshal Tito's death in 1980 and the collapse of the former Soviet Union, the Socialist Federal Republic of Yugoslavia (SFRY) divided into five different countries: Slovenia, Croatia, **Bosnia and Herzegovina** (BiH), the Federal Republic of Yugoslavia (Serbia and Montenegro) and the Republic of Macedonia. After having declared its independence from SFRY in March 1992, BiH fought in a war that lasted over three-and-a-half years. This war destroyed families, communities and infrastructure and left the country littered with landmines and unexploded ordnance. After the Dayton agreement was signed on Dec. 14, 1995, the war officially ended and the country was divided into two entities: BiH and Republika Srpska. Most mine fields are found along the Inter-Entity Boundary Line (IEBL) and the Zone of Separation (ZOS).



### LANDMINE AND UXO

**OVERVIEW:** As a result of the war Bosnia and Herzegovina is a heavily mined country. As of January 1999, Bosnia and Herzegovina Mine Action Center (BHMAC) reported 18,229 known mine fields of an estimated 30,000 mine fields in the country with 750,000 landmines in the ground. BHMAC reports that 83.55 percent are AP mines and 16.45 are AT mines.

### VICTIMS AND CASUALTIES:

From Jan. 1, 1992 through Dec. 31, 1998, the ICRC has registered a total 3,885 mine victims (those injured or killed by landmines). In BiH there have been 145 victims.

**DEMINEING:** The London Peace Implementation Conference in December 1996 stated that Bosnia and Herzegovina were to make all aspects of demining operations exempt from taxes and customs duties. The new Slovenia International Trust Fund could provide up to \$56 million for mine clearance and victim assistance in BiH. BHMAC is currently working on gathering more accurate information about the UXO situation in BiH through maps and surveys.

**WAR REALITY CHECK:** The civilian population of Bosnia and Herzegovina has been subjected to the cruel and inhumane process known as "ethnic cleansing." Landmines are a feature of the human rights abuses that have occurred there. At the beginning of the war, minority groups consisting of local Muslims and Croats were forced into labor detachments to support the Serbs. They were ordered

to collect wood from mined areas or clear houses that might have been booby-trapped. In 1992, Serb forces used landmines to keep mainly Muslim civilians in a makeshift detention camp. One thousand people were there at a time and most were eventually executed. In 1993 deported non-Serbs had to walk across mine fields to positions held by the government. In 1995 a Serb detention camp, which housed 400 men, forced prisoners to participate in mine clearance near the camp. The collapse of the U.N.-protected "safe haven" of Srebrenica to Serb forces in July 1995 led to numerous mine-related deaths and injury among the civilian populace.

**UNMAC:** The United Nations Mine Action Center (UNMAC) was established in 1996 to coordinate demining activities in the country. After concerns were expressed at the London conference in December 1996, which was set up to review the Dayton agreement, authorities in BiH were required to assist UNMAC by providing landmine data, and by making all aspects of mine clearance exempt from duties and taxes.

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## CHECHNYA



**HISTORY:** Chechnya is not recognized internationally as a sovereign state. It declared independence from Russia in September 1991, adopting the name Chechen Republic Ichkeria. In December 1994, the Russian Federation sent troops in the republic and used mines extensively. A peace agreement was signed in 1996, including the delay of the Chechen Republic Ichkeria's official status until Jan. 1, 2001. Chechen leadership currently claims the independence of their republic but Russia maintains that Chechnya is part of the Russian Federation. Chechen law has been established but Russian law still applies. The humanitarian situation in Chechnya deteriorated steadily from the end of the war in 1996. A lack of humanitarian assistance and the withdrawal of nearly all international organizations pervade Chechnya, due to the security situation. Russia has faced a wave of international disapproval of its current military offensive in Chechnya.



### LAND MINE AND UXO

**OVERVIEW:** Both sides used mines during the Chechen conflict, around bases and checkpoints, in cities and sewers, in houses and even on the corpses of Russian soldiers. Russian officials admitted that they mined the main road between Grozny and Nazran in March 1995. The HALO Trust said it had seen new mine fields laid by Russian Interior Ministry forces along Chechnya's border after the 1996 peace agreement. At present, armed groups and armed robbers use anti-personnel mines.

### VICTIMS AND CASUALTIES:

There were as many as 500 civilian mine casualties during the war in 1994-1995. The numbers increased following

the war as people returned to their homes. Since the war ended in 1996, there have been an estimated 600 to 800 landmine casualties, half of whom are reported to be children. The majority of children are suffering psychological trauma. Chechnya is one of the poorest of the Soviet republics with a health care system that was already inadequate before the war. Current reports state that there are 3,500 people in need of artificial limbs. The Chechen Orthopedic and Prosthetics center in Grozny ceased working in 1995 when Grozny was leveled. In Grozny, two-thirds of hospitals and clinics have been destroyed. Because of the kidnapping and murders of foreign aid workers, international humanitarian organizations have been almost absent. Information in other regions is difficult to gather because of a lack of data organization.

**DEMINEING:** No mine field maps have been made available and no survey conducted. Funding for demining is almost nonexistent. The budget does not allow for humanitarian demining. The

responsibility has fallen on Russia, but their financial crisis has limited any action toward the goal. The HALO Trust purchased equipment from Russia and received a donation from the UK Ministry of Defense with the plan of training 100 deminers.

**WAR REALITY CHECK:** The Russian Army lured rebels into a mine field in early February 2000. Survivors said their commanders had told them that the Russians were letting them slip out of Grozny for a bribe—a frequent tactic often employed. Khamzat Tisayev, who was wounded in the foot, said some fighters sacrificed themselves to clear a path, running ahead to set off the mines for the 2,000 fleeing fighters. "The boys marched on the mine and shouted to us: 'Meet you in paradise!' Survivors walked on the bodies of their dead comrades to survive crossing the mine field."

When the rebels, clad in their winter white camouflage, finally reached Alkhan-Kala, they laid scores of wounded on the snow near the hospital, which was too small to take care of all the casualties. Baiyev, the hospital chief, performed amputations with a hacksaw without any painkillers or antiseptics. "These people don't know that they have gangrene and are doomed," Dr. Malika Sabiyeva whispered, turning away from the wounded men. "We don't know what to do. We have nothing to help them."

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# CROATIA



## PROFILES

Eastern Europe & the Caucasus

**HISTORY:** Croatia ceded from Yugoslavia in 1991. Cessation prompted a crackdown by Belgrade and an uprising by the Serbian minority. During the war of independence millions of mines were planted and the main cities were bombed. Western Slovenia and the Krajina were under the control of Serb forces loyal to Belgrade until April 1995 when Croatian HVO forces retook Western Slovenia. Zagreb was shelled in retaliation. In August 1995 Croatian forces swept across the border of Bosnia and Herzegovina to pursue the fleeing Serbs, and to dislodge Serb forces near Croatian territory. Croatian officials came out of the Dayton Peace Accords of November 1995, with an agreement by Belgrade that Serbs vacate the disputed and oil-rich Slavonia region. Eastern Slovenia was returned to Croatian control on Jan. 15, 1998.

**LANDMINE AND UXO OVERVIEW:** Authorities estimate that there may be as many as 3 million mines in Croatia with most laying along the former confrontation line. Both sides of the conflict made liberal use of mines. Mines were laid to protect defensive positions and in areas of strategic and economic importance: railways, utility stations, pipelines and even Plitvice National Park. Most mine fields are unmarked. Where marking does exist, it may not be accurate. As a result of four years of fighting, there is considerable UXO, over 300 tons, in areas where there has been conflict, like Dubrovnik. At least 5,200 miles of Croatian territory is littered with mines with at least 3,000 miles in Eastern Slovenia, the last Serb held territory. Fifteen-thousand mines were laid in the area behind Sibenik close to a



popular tourist spot, the Krka waterfalls. The Croatian Ministry of Reconstruction estimates it will take at least eight years and \$400 million to demine the republic.

**VICTIMS AND CASUALTIES:** Since 1990 over 700 people have been permanently disabled. There have been over 956 amputations. Other statistics state over 300 children have been killed and 1000 injured by mines. Between 1990-1998 other statistics report that 2,437 people have been injured or killed. Accurate statistics have been difficult to obtain, especially in Serb controlled regions. Currently, there are no prosthetic workshops or disability laws in Croatia. Mine victims receive first aid and medical assistance based on their health insurance coverage.

**DEMINING:** Mine clearance is currently underway. Previously, Croatian mine clearance had been carried out by the Croatian Army, Special Police and Civilian Defense. In June 1996, the Croatian Government established a demining agency known as MUNGOS. In Eastern Slovenia, two Serbian demining agencies, TNT and DESK are conducting mine clearance under contract with MUNGOS. In

February 1998 national law was changed to allow for more international participation. Between 1995-1998 some 50,000 mines were removed.

**WAR REALITY CHECK:** Amnesty International reported civilian torture when the Yugoslavian National Army moved into Lovas, Croatia followed by Serbian paramilitary. After beating and killing many civilians, 50 civilian males were ordered into a field to pick grapes. They entered the field holding each other by the hand and quickly realized they were entering a mine field. Upon spotting a trip wire they stopped, at which point they were ordered to pull it by hand. A series of landmine explosions followed interspersed with machine-gun shots. The account describes some of the victims being so badly wounded that they begged to be killed.

**THE CROATIAN MINE ACTION CENTER (HCR):** In 1998, the Croatian government established the Croatian Mine Action Center to aid Croatia in their mine action programs. HCR provides assistance in all aspects of mine clearance to include mine awareness, mine surveys and minefield marking. Based in Zagreb, HCR is also active in raising funds for mine-related activities.

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# GEORGIA



**HISTORY:** Following the April 9, 1991, independence from the former Soviet Union, Georgia was beset by ethnic and civil strife. The continuing argument over the political status of Abkhazia resulted in war. In September 1993, Georgian forces withdrew from the Abkhazia region. Although Georgia stabilized, South Ossetia and Abkhazia remain elusive. The conflict in South Ossetia has been dormant since spring 1994, but sporadic violence continues between Abkhaz forces and Georgian partisans in western Georgia. Of their estimated population of 5,000,000, Georgia still has about 250,000 internally displaced people as a result of these conflicts. After adopting a new constitution in October 1995, Georgia has focused on economic reform and governmental stability.

**LANDMINE AND UXO OVERVIEW:** The U.N. Security Council has condemned the continued laying of mines, including mines of a more sophisticated type, and has called upon parties to take all measures to prevent mine laying. Mines exploded in the town of Ochamchire and later during the November 1996 elections in Abkhazia. Abkhazia is heavily mined and these mines prevent the repatriation of ethnic Georgian refugees. The Inguri River is the front line of the



conflict and the riverbanks on the Abkhaz side are mined. Major and secondary roads are mined. The Gali area of Abkhazia is especially affected by mines. There are an estimated 150,00 AT and AP mines in Georgia. The mines are predominantly along the Inguri River, the coastline of Gali Province, which contain an estimated 15,000 mines, and in the Ochamchira and Tkvarcheli regions, which contain an estimated 27,000. There are maps documenting the mine fields, but many of the mines are unmarked, some maps are incorrect and access to the true maps is limited.

**VICTIMS AND CASUALTIES:** School children have been blown up taking shortcuts and civilians and Commonwealth of Independent States (CIS) Peacekeepers have been killed and wounded, but there has been a recent reduction in casualties because

a large number of people have left the mined territories. According to information from the Head of Science and Technical Research, Department of Georgian Army General Staff, about 70 percent of casualties during the war were landmine victims.

**DEMINING:** Georgia has no national capacity for demining, mine awareness programs or survivor assistance. It lacks funds, proper equipment and trained deminers to conduct mine clearance operations. The government has expressed an interest in U.N. demining assistance, but none can be provided without similar approval from the Abkhaz side. The non-governmental organization HALO Trust is conducting humanitarian mine clearance in Abkhazia. The CIS Peacekeeping Forces in the Gali area refused to carry out further mine clearance in 1996 because of the security situation.

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# PROFILES

Eastern Europe & the Caucasus

## KOSOVO



**HISTORY:** Serbia and Montenegro are the only two remaining Yugoslavian republics. The federation began to dissolve in June 1991, when Croatia and Slovenia declared independence. The Republic of Serbia has two autonomous provinces, Kosovo and Vojvodina, which are administratively a part of Serbia. Most of the population in Kosovo is Albanian.

### LANDMINE AND UXO

**OVERVIEW:** Information on the problem in Kosovo remains inconclusive. Yugoslav forces, paramilitary troops and KLA fighters have laid mines and booby traps. UXO litters the area. The border areas are the most affected. There are more than 10,000 known defensive mines on the borders, but only the Yugoslav army has information about the miles of land affected. A Senior Survey Officer for HALO Trust estimated that there are at least 500,000 mines in the ground and there may be 3,000 UXO. Ordnance can also be found in the surrounding waters. Under the terms of the Military Technical Agreement, NATO land forces are responsible for clearing roads and military locations. Serbian forces are responsible for supplying NATO with detailed records of all mines and UXO with the hope that Serbian forces will clear the Kosovo/Macedonia border areas. Serbian officers have been arriving in Pristina to implement these roles. The KLA does not have records of mine field planting. Many international mine clearance agencies believe that mine fields will be easier to locate than they were in Bosnia. The war in Kosovo was shorter than the four-year war in Bosnia, the geographic area is smaller and there may be more information available regarding mine field location. In Kosovo, the most affected areas are roads, houses and schools, and forests. An estimated 50 percent of Kosovo's livestock is dead or missing from the crisis.



**VICTIMS AND CASUALTIES:** AP and AT mines are the most immediate obstacles for refugees returning home. In the first week ethnic Albanians began returning to Kosovo there were over 30 mines and UXO accidents. Some reports have stated that at least 27 people have been killed in 61 reported mine incidents just for the month of June 1999, according to NATO figures. This would put mine casualties as high as 11 per 100,000 people. About 20 percent of casualties have been KLA deminers. The World Health Organization in Pristina reported that between June 13, 1998 and July 12, 1999 there were as many as 170 deaths in Kosovo caused by mines and UXO. Despite the economic and social problems in the Federal Republic of Yugoslavia, they have a developed surgical and rehabilitation services for landmine victims. The Institute of Prosthetics in Belgrade is the only institution in FRY that can provide full treatment for landmine victims to include orthotics, rehabilitation, reintegration and prosthetic production. Landmine survivors during their rehabilitation process are provided skills training compatible with their disability.

**DEMINING:** Approximately 12 mine action organizations are now operating in Kosovo. These include CARE, NPA and

MINETECH. Thirteen dog teams with 26 dogs have been deployed. The U.N. High Commissioner for Refugees has intensified demining work with priority areas including Prishtina, Urosevac, Prizren, Suva Reka, Djakovica, Pec, Podujevo, Gnjilane and Glogovac. The VJ has reported 425 Protective mine fields to NATO. Where VJ forces established headquarters often in houses and villages, nuisance mines and booby traps were placed for denying movement to KLA forces and terrorizing local populations. Many of these mines are trip-wired fragmentation mines. As part of the peace settlement the KLA were required to clear these mines and have reported completion of this activity. UXO dropped by NATO aircraft on VJ positions with Cluster Bomb Units are the major source of contamination. NATO dropped over 1,000 cluster bombs over Serbia, including Kosovo. Recent reports have indicated that the demining process is not continuing at the required rate and many claim this is because of the lack of technical means. The UNMAC estimates that it takes from 5 to 21 days to clear a cluster bomb strike after it has been located. Kosovo civilians are also being trained in demining by international aid organizations and have cleared 400 mines.

**WAR REALITY CHECK:** The ICRC concluded from its Psycho-Social Needs Assessment that ethnic reconciliation is a goal, but currently unfeasible. "Kosovo is seeped in pain, hatred and desire for revenge against the Serbs. Kosovars do not speak of reconciliation. Hatred is the accepted norm transferred from adults to youth."

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## MOLDOVA



**HISTORY:** Moldova is split into two main regions, Bessarabia and Transnistria. Bessarabia is in the eastern part of historic Moldova and is mostly Romanian while Transnistria is the land on the eastern bank of the Nistru River and is mostly Slavic (Ukrainians and Russians). After the Russo-Turkish War in 1806-12, Bessarabia ceded to Russia. Finally on Aug. 27, 1991, Moldova declared its independence from the USSR and was recognized by the United States in December of that same year as they opened an embassy in its capital in 1992. A new constitution was adopted on July 28, 1994, which forever replaced the Soviet Union's constitution and was a symbol of the complete break away from the USSR.

### LANDMINES AND UXO OVERVIEW:

In August 1996, over 4,500 mines were destroyed in Transnistria in the span of two months. Many believe that the disposal of these mines is very important for the safety of the people while the Republic says that the explosions are destroying the environment and will arrest and prosecute anyone who attempts to do so. Bessarabia has accused Transnistria of producing the mines and shipping them into Bessarabia as well as other countries. The Moldovan army has over 12,000 mines in their possession even though the government denies any knowledge of the production of these mines. The Moldovan army is not the only one that has access to landmines. In 1998, grenades and even mines were used in several different burglaries throughout Moldova. The apprehension and confiscation of these landmines is currently unclear, but the government officials are still working hard to find all of the undiscovered landmines to destroy them. In May 1998, the Foreign Ministry of Moldova stated



that all but 15km of the 72km affected by landmines have been cleared. The remainder of this land is being cleared with the help of the United States.

### DEMINING:

The demining process in Moldova has been marked as painstakingly tedious because of the constant problems that arise. The Moldovan governmental officials as well as the army have been working over time to clear as much land as possible. During the 1991-1992 conflict in Dniester, Separatist and Russian Cossacks mined much of the village's fields and roads that surrounded the center of the war zone, leaving most people little access to their homes. After the Dniester war ended, over 371 acres still remained uncleared. Vladimir Munteanu, chief of the demining unit in the Staff of the Army, announced that countless vineyards and forests surrounding the villages of Cosnita and Pogrebea needed to be demined. These two areas are of the greatest priority because there are no maps defining the position of the landmines for the deminers. Sgt. Boris Milhailov and Pvt. Ion Frunza were killed while searching for and demining the landmines in these regions. Other landmine incidents have continued to occur all

throughout the country. Three other Moldovan soldiers were killed while 24 others were severely wounded during a peacekeeping operation in a security zone.

Vladimir Bodnar, Joint Control Commission Transnistrian co-chairman, believes that Moldova should not exclude the funds that are being negotiated with the United States. These funds are needed for demining all throughout Moldova but specifically in the region of the Pogrebea village. Bodnar does not want American forces and experts flooding into Moldova. He explains that he simply wants funding for special equipment and machinery to help with the overall demining process. His plan is for an indigenous team of local workers to be paid and funded by other countries, but have Moldavians working to preserve and restructure what is left of Moldova.

### VICTIMS AND MEDICAL FACILITIES:

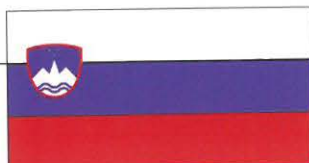
Thousands of people have been affected by the presence of landmines within this country as well as hundreds of other countries. The Moldova Foreign Ministry reported that in one incident from 1992 to 1993, two Moldovan peacekeepers were killed, eight injured and six severely wounded. Landmine explosions are not only devastating to a single individual. For every one person harmed, there is a family in need and suffering due to the unfortunate explosion. The facilities in Moldova leave much to be desired, as there is a shortage of good doctors and necessary equipment. These facilities can offer the basic, minimum treatment, which leaves most to fend for themselves.

**CONTACT INFORMATION:**  
Not available

# PROFILES

Eastern Europe & the Caucasus

## SLOVENIA



**HISTORY:** The Republic of Slovenia is a Central European country about the size of New Jersey, with a population of two million inhabitants. After World War I, Austria-Hungary disintegrated and Slovenia joined the new state, the Kingdom of the Serbs, Croats and Slovenes. The people of Slovenia voted for independence and sovereignty at a national referendum held on Dec. 23, 1990, and on June 26, 1991, the Republic of Slovenia proclaimed its independence.

**LANDMINE AND UXO OVERVIEW:** Slovenia still has a problem with landmines leftover from both world wars and a short independence war in 1991. Most of the World War I ordnance consists of unexploded cannon grenades and, to a lesser degree, unexploded mines and other devices from World War II and the 1991 war are a problem. The Yugoslav Army laid most of the mine fields around military targets. While most of the unexploded devices have been cleared, it is unknown exactly how many mines remain.

**DEMINEING:** Slovenia implements demining under the framework of the Civil Defense of the Republic of Slovenia. The Slovene Civil Defense and the Slovene Army Forces clear most



UXO. Most emphasis is placed on the training and educating of the 130 troops equipped for demining. One of The Republic of Slovenia's biggest steps in demining has been to set up the International Trust Fund for Demining and for the Assistance of Mine Victims in Bosnia and Herzegovina on March 12, 1998. The Trust Fund is committed to helping Bosnia in its current landmine problem, and eventually helping them establish their own demining programs.

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## UKRAINE

**HISTORY:** Ukraine has been struggling for its independence from several countries that have tried to consume it and minimize its boundaries. The Bolshevik Revolution prompted the Russian Ukrainians to establish a new republic in 1917 while the Austrian Ukraine waited until a year later to establish their connection with the Russian Ukraine. Ukraine was excluded from much of the decision making during the closing of World War I and Poland was given the land they wished for, Galicia, in 1919. This single act sparked war once again. The war continued as the country itself was thrown into internal turmoil and change and the Ukrainian Communists split into the another faction, the Ukrainian SSR, who later joined with the Soviet Union. Ukrainian nationalism grew as the struggle for independence persisted and the fight for a Greater Ukraine fanned the flame of war. In December 1991, Ukraine separated from the Soviet Union, founded its own constitution and began to rebuild its nationalism and independence once more.

**LANDMINE AND UXO OVERVIEW:** Official reports state that over 1 million landmines are buried deep within Ukraine's soil, although the exact numbers vary. Since 1945, over 3

## UKRAINE



million landmines and UXO have already been removed, but many still remain uncharted or simply uncleared. The most affected areas are thought to be rural woods and fields, namely two World War II battle sites fought between Russia and Germany, but many people are still being harmed by these mines. In 1995, authorities reported that since 1945 over 1,500 innocent people have been killed or maimed by landmines while another 130 deminers have been killed while trying to clear the land. Ukrainian government states that since their independence in 1991, they have not produced and do not plan on producing any landmines. The continuous struggle to save lives and establish a safe environment plagues many countries like Ukraine.

**VICTIMS AND THE MEDICAL FACILITIES:** From 1945 to 1995, over 1,500 civilians and over 130 deminers have been killed by the plague of landmines with Ukraine. Many landmine victims are faced not only with the never-ending trauma of their encounter with landmines or UXO, but also with the reality that most of the nearby hospitals and other facilities are not the best care these victims could receive. These victims are not only scared from the explosion and the consequences of an encounter with landmines, but they are usually permanently disfigured or even paralyzed. Stepping on a landmine can alter a person's entire life in the blink of



an eye. Unfortunately, there are limited doctors and even fewer pharmacists. One organization is still helping. The Social Rehabilitation Center in Kiev provides artificial limbs to those who have encountered landmines. There have been several helpful laws enacted to help keep the disabled working and surviving:

- Discounts on electricity and gas
- Free city transportation
- Free medical treatment
- Free dental appliances

These laws have established a place for the disabled within Ukrainian societies all throughout the country. Despite these laws, the effort to find better facilities, better doctors and a way to better help patients still continues today.

**DEMINEING:** In March 1998, the Ukrainian government disposed of roughly 101,028 PFM-1 landmines. The government has cleared over 3 million landmines, but over 1 million are left to be cleared. The most heavily mined areas throughout the country are

Vinnitsa, Kiev, Odessa, Ternopol, Kerch and Zhitomir. The Ministry of Defense does most of the demining. There are special teams that have been created for the sole purpose of destroying landmines. Two of the most important teams are the Police Demining Teams (SPDT) and the Bombs Disposal Division. SPDT was created in 1995 by former military and militia personnel. This group works mainly in densely populated areas while the Ministry of Defense handles the rest of the mined lands. These teams handle most of the heavy work while the Ukrainian Secret Service and National Guard help with anything that needs extensive service. There are hundreds of ways to demine huge tracts of land whether it is through human effort, machinery or "free-running" dogs. Many different organizations use dogs, which seems to be one of the most effective methods of demining. The main impetus behind the clearing of the landmines in Ukraine is the Ukrainian Armed Forces, which splits into hundreds of teams to help find as many landmines as possible.

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# Georgia on my mind

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**THIS ISSUE OF THE** *Journal of Mine Action* focuses on one of the world's most interesting regions as it examines landmines and unexploded ordnance in Europe and the Caucasus as well as highlighting organizations from that region engaged in humanitarian mine action. Whether we are discussing landmines, post-conflict reconstruction, geo-politics, resources or regional security, you can't seem to have a comprehensive discussion of the region without, in some way, viewing Georgia as a key to the future of the Caucasus.

The landmine situation in Georgia is arguably heaviest in the contested Abkhazia region resulting from the internal conflicts between separatists and national forces in 1992-1993. There are estimates of approximately 35,000 landmines in 500 different areas with only a few being marked by HALO Trust. The post-war violence continues as the UN Observer Mission In Georgia (UNOMIG) has been targeted by terrorists as have civilians and CIS peacekeeping forces who have had to contend with renewed laying of mines in the Gali region. The mine incidents from the attacks since 1994 are estimated at 106 injuries and 64 people killed. There are 480 amputees in Abkhazia with the ICRC estimating that 375 of them using their orthopedic workshop. No psychosocial rehabilitation programs are evident and mine awareness programs are minimal. HALO estimates that Abkhazia could be relatively mine safe within 5-7 years with an increased emphasis and the necessary resources. Much of the aid to Abkhazia is predicated on political issues being resolved. Therefore, the Abkhazi themselves hold the key to a solvable and definable mine problem that is key to their reconstruction and redevelopment.

In addition to these internal concerns, Georgia's neighbors provide a mine threat of a different kind.

As the war in Chechnya shifts from an all-out ground assault to one of counterinsurgency and guerilla warfare, the southern Caucasus along the 80-kilometer (48-mile) Chechnya-Georgia border has become a focus for the Russian military looking to wipe out the remnants of Chechen resistance. Control of the mountainous border, particularly in the Argun gorge and the village of Shatoi, is a strategic imperative for what remains of the Chechen fighters looking to preserve their claims to independence from Russia.

Georgia refuses to become involved in the war and has stated that it checks all incoming refugees and has registered over 5,800 Chechens sheltered in five different villages in the Akhmet area. The Georgian Ministry of Foreign Affairs indicates 1,000 of these are men of fighting age. This stated Georgian neutrality is unlikely to sway Russia where the words 'Chechen,' 'paramilitary' and 'terrorist' are used interchangeably. Russian intelligence claims the Chechens have bases and medical facilities in Georgia and fly two helicopters to resupply units within Chechnya. Even though there have been joint border operations (code-named Undercover) by the Georgian and Russian police and border forces in January, the existing situation is likely to disintegrate rapidly. The Organization for Security & Cooperation in Europe (OSCE) also has a monitoring unit along the border. The first test of how effectively Russia has sealed off the borders may come in late February marking the anniversary of Stalin's deportation of the entire Chechen population to Central Asia in 1944. This date is expected to draw some sort of offensive action from the Chechen resistance. The probable outcome can realistically be a Georgia-Chechnya border heavily mined by the Russians, to seal off whatever insurgents remain in Georgia.

This tactic would mirror that used in Afghanistan which saw an indiscriminate and heavy proliferation of air-delivered PFM-1 landmines by the Soviets into inaccessible regions believed to contain large groups of the Mujahadeen.

These 1,000 Chechens in Georgia, believed to be gathering in Pankis gorge, were described by Konstantin Totsky, director of Russia's Federal Border Guard Service, as militants waiting to break into Chechnya. This is raising the possibility that the Russians are generating a "self-defense" rationale and providing justification for an incursion into Georgia. Russia still retains a large military presence in Georgia under the terms of Georgian Independence signed in 1991 but are presumably in the process of closing their three largest bases by July 2001 although talks on handing over the last of these don't begin until sometime this year. The implications for additional APL use by the Russians are significant and the response from the West will be crucial in swaying Georgia toward a more pro-Western stance.

The ties between the U.S. and Georgia are growing. Last October, the U.S. presented the Ministry of Defense with over \$1.8 million USD in uniforms and in the same month, demonstrated the capabilities of the UH-1H helicopter, which also will be part of a 10 helicopter package granted to Georgia under the Foreign Military Financing (FMF) program. These were preceded earlier by a \$1.6 million USD package of NATO-compatible radios and the establishment of a full-time Military Liaison Team based in Tblisi and coordinating activities with the Georgian Armed Forces. These and other significant cultural exchanges and economic arrangements have been a clear indication of support for Georgia and desire for an expanded US-Georgia relationship.

Probably the most crucial mine action program

planned to date was announced by the US Interagency Working Group (IWG) on Humanitarian Demining on December 9, 1999. In what is being referred to as the *Beecroft Initiative*, the US Embassy in Tblisi has been asked to approach the Georgian government on the possibility of establishing a training center for humanitarian demining to work with not only the Georgian forces, but also to host units from both Azerbaijan and Armenia to be trained together. This innovative training concept was developed by, and thus named for, Mr. Robert Beecroft, Deputy Assistant Secretary of State for Political-Military Affairs. Armenia has agreed to participate and Azerbaijan was recently approved for US support as well. The U.S. is sending a Requirements Determination Site Survey (RDSS) Team to work with the Georgian government to develop a specific course of action for implementing this training program. This initiative, once underway, will be a significant step toward regional stability and cooperation, demining capacity building and effective information sharing and communication necessary for security and development.

The geography and economy of Georgia reflect a pivotal position in the Caucasus, and overtures by Georgia to the West indicate a willingness to establish itself as a key player in the formulation of the future of the Caucasus states. Balancing these new relationships with historic ties to Russia and ethnic and cultural influences from Iran will certainly challenge the Georgian government. The landmine threat and the region's ability to address it, can be a success story very quickly with a broad range of cooperation. The threat of new mines, both in Abkhazia and along the Chechen boarder, must be avoided if any progress at all is to be achieved. As the Beecroft Initiative unfolds and the Chechen end game plays itself out, Georgia will be on my mind—a lot. ■



Joe Lokey

editorial: Joe LOKEY

# Conferences: who needs them?

by Dennis Barlow,  
Director, Mine  
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**THE GLOBAL MINE ACTION** process seems to spawn conferences. During the past three years there have been at least 13 major gatherings which contained in their agendas major activities dedicated to improving demining operations. What have the three years of meetings, issue development, and projects produced? Have the conferences and attempts to frame operators' needs been a wasted effort, characterized by travel boondoggles of innumerable representatives to venues far and wide? Or have they driven real development and positive achievement?

## To Meet or Not To Meet

There are invariably those attending the conferences who have, formally or informally, decried the proliferation of these meetings and stated that the money spent to hold them would be better spent on direct support to a demining operation. While these utterances are viscerally tempting, and momentarily dramatic, I believe that this kind of blanket condemnation of demining workshops, conferences, and seminars is off the mark.

The MAIC at James Madison University has attended, hosted, and participated in numerous conferences and workshops, which have addressed the key issues of humanitarian demining, especially the core issue of how we discern and meet the needs of demining operators. JMU has reported the issues, concerns, and suggestions from these efforts and, in some cases, has processed that information for input into other events and venues where it has been developed further. I believe that the dialog, actions, learning, networking, coordination, learning and appreciation, which have resulted from these meetings have stimulated the demining process and facilitated much progress.



Dennis Barlow

## Focusing on the End User

Who is the end user? Three years ago, we would have said that he is the mine clearer; the "guy at the pointy end of the stick." Today there are still those who insist that the operator who performs mine clearance is *the* end user, and that technology is (or should be) aimed solely at his activities. There is a competing point of view defending the landmine clearer as the central focus of technology improvements and enhancements, while the wide range of activities which are encompassed by the concept of Mine Action have broadened the definition of an "end user."

Many in the demining community, acknowledge that those engaged in direct support of the "deminer" also require equipment and technology advances based on their unique needs. Personnel who mark and monitor mined areas, dog handlers, mine action center managers and medical support personnel (paramedics), are but a few of the non-clearance operators who are often included in the list of mine action end users. Whether advances toward better geographic information systems (GIS) packages, dog-handling techniques or MEDEVAC systems, technological advances which improve any aspect of the mine action project will enhance the entire demining program.

I believe that this trend reflects, not only the integrative and comprehensive nature of Mine Action, as it is now understood. It also accepts the reality that demining must be considered as part of a developmental process which must proceed in the context of other activities and infrastructure enhancement plans.

## Operators, Technologists, and Policymakers

As the international effort to identify operational needs was gearing up, several dynamics became obvious. Perhaps the most apparent was a gulf which

existed among the major demining groups. Operators did not feel that they were heard. Technologists did not understand the world of the deminer. Policy makers were trying to fulfill the demands of high politics while trying to understand the parameters of operators and technologists.

Worse, operators were not always in consonance with other operators. NGO operators were wary of "for-profits," while they were suspicious of the practices (motives?) of military elements assigned to humanitarian demining missions. It even turned out that deminers from various regions had different needs than those in other areas; e.g. deminers in Southeast Asia have a vastly different set of needs than those in Northeast Africa.

Nevertheless, the frantic conference and meeting schedule of the past three years has had an immensely beneficial effect on melding, if not the motivations, than at least their knowledge of the capabilities and limitations of each constituent group. What's more, it seems as if the suspicion, which once hall-marked the relationships among operators, "techies" and policy-makers, has largely dissipated, being replaced by a healthy respect for the tasks of each of the groups, and has engendered a feeling of kinship and empathy among groups working the demining issue.

## Coordination and Communication

Another set of commonly held beliefs early in the process, was that all that was needed was an accurate sense of what the operators needed and everything would just fall into place. Slowly the realization hit home that no one was, or could be, in charge and that testing, evaluation, selection and deployment do not just happen. Humanitarian demining efforts are not like unified military operations; humanitar-

ian demining embraces a host of very diverse functions, organizations, climates, societal needs and countries. Therefore, no one operator, technician, or decision-maker can declare what will be universally acceptable or appropriate.

In order to develop procedures by which needs are identified and fulfilled by a research program, which leads to efficient procurement and deployment, universally accepted means of communicating, coordinating, and collaborating are necessary. To that end, the International Management System for Mine Action (IMSMA) is dedicated, as is the nascent Demining Technical Information Forum (DTIF), and indeed several formal and informal communications and coordination efforts which have been suggested at humanitarian demining meetings over the last three years.

Information among demining communities has blossomed during this time. With the increased communications networks (the Geneva International Center for Humanitarian Demining (GIC), the MAIC at JMU, the Joint Research Center (JRC), the Canadian Center for Mine Action Technology (CCMAT), etc. have come increased understanding and collaboration of global partners who have been able to focus more effectively on improving the safety and effectiveness of the end user.

## The Expansion of Needs

Three years ago, a demining operator might create a list of needs, which would today look pretty modest. As mine action plans have become more ambitious and sophisticated, they encompass a greater degree of integration with other programs and are coordinated with other demining functions. The operator's needs have grown. He has also become aware of emerging and pertinent technologies and has

learned how to leverage his methods with others and with new capabilities. The deminer, in short, has learned to apply new methods and equipment to his requirements. We should applaud this development, because, while it makes pinning down his needs more difficult, it allows us to strive for ever more effective and dynamic ways of meeting the challenges of mine action operations.

End users now need effective mine dogs, reliable information and data base systems, dedicated GIS packages, better prostheses and procedures, and on it goes. The knowledge of these improvements and how they can be fitted to operational requirements has come about largely through the interchange of ideas which has taken place during the "show and tell" portions of the conferences and meetings summarized above.

### Real Progress

Perhaps one of the most encouraging and demonstrable sets of results of the actions of the Mine Action community, has been the creation of a number of programs and initiatives designed to facilitate identifying and satisfying the needs of the operator.

The DTIF is a collective and creative outreach, which should provide a universally accessible source for demining technology information.

The "Rapid Prototyping" program underway at Ft. Belvoir (under the auspices of the U.S. Office of the Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict) is not only determining and verifying end user needs, but is putting the most promising technologies which are applicable to meeting them, on a fast-track.

The Survey Action Center (SAC) and IMSMA are programs aimed directly at meeting the information needs of deminers, which should make a significant impact on management and preparation for their plans and operations.

The demining management studies underway at Cranfield University should provide a very real way of ascertaining and fulfilling operators needs, and of developing a viable management training program.

The User's Focus Group assembled and working under the auspices of the UNMAS and GIC, allows for operators to make a direct and timely impact on demining standards and guidelines.

There have been times (many times!) during the past three years, when naysayers and friends alike, have been critical of the international approach to demining. They have glibly poked fun at the number of meetings, or scoffed at the seeming impossibility of it all. Some wags even talked about creating an organization for the ban of landmine conferences.

But such derision ignores the great strides that have been made in making the demining operator the center of a new and amazing cooperative effort to improve his lot, as well as the vast amount of work, good will, and thinking that has given rise to some rather remarkable international efforts. The advances are not only noteworthy for what they have accomplished (and promise to), but for the fact that they have come about purely voluntarily and without coercion. ■

*This is an excerpt from a paper presented at a meeting of the Standing Committee of Experts; Technology in Mine Action, Geneva, Switzerland, on Dec. 13, 1999.*

# Mine Awareness Week at James Madison University

One of the goals of the Mine Action Information Center (MAIC) is to use all of the resources available to it because of its collegiate setting. The central offices of MAIC share a building on the James Madison University campus with students, professors and daily classes. One of the major benefits of this humanitarian program's location is the potential for student involvement in the very urgent issue of demining. MAIC recently experienced a significant amount of student involvement and curiosity when political science and geography students combined to organize Mine Awareness Week.

Throughout the first week of November 1999, every JMU student who walked through The Commons in front of the dining hall had to ask "What are these red X's and why are they scattered everywhere?" The red X's were the brainchild of the group of students responsible for Mine Awareness Week. "There are going to be red X's on the commons and we aren't going to tell people until later in the week that they actually represent landmines so that the students will understand how easy it is to step on one," junior Jen McKeever said. After learning that the X's represented landmines, it was staggering for students to realize how many normal activities, such as riding a bike or walking a dog are affected by landmines. Later in the week, students could hear speakers such as Tom Smith, from the Department of Defense, and MAIC's own Joe Lokey.

Propelled by the students, the Mine Awareness Week atmosphere was not as somber as its subject was and publicity for the event was similar to advertising for other student activities. On one of the warmest days of the week in November, students swarmed around the landmine-awareness booth. The Franklins, a local folk band, played for the day and spoke about landmine statistics in between songs. At the awareness table, the students handed out free landmine-awareness comic books and sold green ribbons for donations to Landmine Survivor's Network.

Many JMU students showed interest in initiating an Adopt-A-Minefield program at the university. To date, MAIC has involved over 80 JMU students with their efforts. For students, the four years spent in college present many important social issues from which to pick and choose. With MAIC and its agenda front and center on the college campus, who knows how many JMU students will graduate and later contribute to the humanitarian effort of demining.



Secretary of State Madeleine Albright said of MAIC at JMU, "James Madison University's Mine Action Information Center has grown into far more than a clearinghouse for knowledge. It is expanding the boundaries of knowledge about a host of mine-related topics. We have some 80 professors and students at the university to thank for that."

(Left to right) A group of JMU students stops to look at the Mine Awareness Display. The Franklins, a local band, entertain and inform on JMU's Commons.

Photos c/o Stephanie Schlosser