D6 Perurac Lake, Bosnia: A Multidisciplinary Operation to Locate, Recover and Examine DNA Samples, and Identify the Missing From Balkans Conflicts

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After attending this presentation, attendees will become aware of logistical and operational issues in locating and recovering human remains from a riverine environment, the complications these conditions create for examinations, and the impact such an environment has upon relative rates of success of DNA amplification from bone.

This presentation will impact the forensic community by illustrating the successful application of a scientific investigation process from search to identification. The efficacy of DNA analysis from human remains that have been taphonomically altered by fluvial activity over a 20 year period is demonstrated. Moreover, the anthropological re-association of remains, led by DNA linkages, combined with contextual site assessment, missing person's lists, and witness accounts provide identification and can potentially support or refute past behaviors and investigative interpretation.

Perucac Lake has been a presumed site of deposition for numerous individuals, as a result of conflicts in the region. The Lake was formed by damming the Drina for hydro-electricity. In the summer of 2010 when water levels were lowered, a malfunction in the turbines of the dam forced authorities to dramatically reduce the level of the water to enact repairs. An opportunity arose to survey a significant section of the exposed land surface with human remains observed on the banks and riverbed. A multi-national, multi-agency effort was launched with the goal of locating, identifying, and recovering as much as possible.

With the International Commission on Missing Persons (ICMP) assistance, line searches and manual excavations were conducted along on both sides of a 50 kilometer length of the lake and river from Visegrad Bridge to Bajina Basta dam. Approximately 2.5 million square meters were searched over a period of two-and-a-half months in topography along the river that varied from steep canyons to flat beach-like coastlines and mudflats.

Approximately 450 cases varying from a single bone fragment to large quantities of mixed bones, were located, recorded, and recovered from land within four municipalities in two countries: Visegrad, Srebrenica, and Rogatica in Bosnia and Herzegovina; and, Bajna Basta in Serbia. Following preliminary anthropological examination, the Minimum Number of Individuals (MNI) for all recovered cases was established to be 97, based on the right femur.

Remains recovered in Bosnia and Herzegovina were sent to Visoko Mortuary, where ICMP participated in bone sampling for DNA analysis. The remains recovered in Serbia were sent to the Forensic Medicine Institute in Belgrade, Serbia, where they also underwent bone sampling for DNA analysis. The variation in success in extracting DNA samples from different skeletal elements was statistically examined to provide guidance for future sampling strategies for similar investigations.

As of July 2012, 220 unique DNA profiles had been obtained from all the recovered cases, with anthropological re-assessments, guided by DNA profiles, re-associating body parts or single bones to identify individuals. Contextual and evidence analysis also allowed cases to be differentiated between recent conflict from those of the conflicts of previous eras. The investigation and results of the scientific process demonstrate the potential to recover remains and identify the missing from a difficult search environment after many years.

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