NO MAN LEFT BEHIND: DNA IDENTIFICATION OF THE DUSTWUNS

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The Armed Forces DNA Identification Laboratory (AFDIL) supports the ongoing mission of the Armed Forces Medical Examiner System (AFMES) in the identification of service members via DNA. This includes the identification of fallen service members from current conflicts as well as contractors who support the ongoing mission in Iraq. Personnel who are absent from duty involuntarily, but the circumstances do not allow a definite determination of a missing or deceased status are designated Duty Status – Whereabouts Unknown (DUSTWUN). Between late March and early July of 2008, AFDIL worked to establish DNA identifications of nine DUSTWUN individuals missing from four separate incidents and recovered after durations ranging from 14 months to 4 years. Three of these individuals were active duty military personnel and six were security contractors. Four of the contractors were former military personnel and references were readily available through the military's DNA reference collection, the Armed Forces Repository of Specimen Samples for Identification of Remains (AFRSSIR) for seven of these DUSTWUNs. DNA analysis on the remains proved to be challenging due to the harshness of the environment. The samples provided for DNA analysis were primarily skeletal, but also included three soft tissue samples. The majority of the bones were stark white and almost appeared bleached, probably due to sun exposure, the sand, or a combination thereof. A Phenol-Chloroform-IsoamylAlcohol extraction protocol was performed for each sample, and in some cases the bone extraction was aided by a demineralization buffer developed by the AFDIL research section for use with ancient remains. STR profiles were obtained using the PowerPlex 16 and MiniFiler amplification kits. DNA identification of the individual missing for four years was accomplished through STRs and mitochondrial DNA sequencing. This presentation is a case study focusing on the difficulties encountered while processing these samples and the various methods utilized to establish DNA identification.