H7 Observed Taphonomic Changes and Drift Trajectory of Bodies Recovered From the Tidal Thames, London England: A 15-Year Retrospective Study

Victoria L. Brewer, BSc, Bournemouth University, School of Conservational Sciences, Talbot Campus, Poole, Doreset BH12 5BB, United Kingdom*

Attendees will gain a general understanding of the processes involved in marine/aquatic taphonomy and its application for the determination of postmortem submersion interval. It is hoped that after gaining an understanding of the basic principles of fluvial transportation, attendees can apply these in future casework within their own spheres to determine cadaver location and enhance recovery from aquatic environments.

With the discovery of human remains, one of the most important issues to be considered is the postmortem interval (PMI), as it is used to examine missing persons files in search for a likely match. It is imperative that accurate PMI determinations can be established as it can mean the difference between the positive identification of an individual or that individual remaining unidentified in the morgue. In forensic settings there is a growing need to understand aquatic decomposition in order to interpret decompostional changes as an aid to the determination of perimortem interval. The environmental context in rivers, lakes or oceans is different to that on land. Therefore, separate decomposition and preservation models need to be developed. This presentation will impact the forensic community and/or humanity by providing insight into the principles and forces that act upon a human cadaver in an aquatic environment. This data can potentially be applied to fluvial drift models that aid in not only the determination of search strategies for locating human remains, but to also the calculation of location at which they entered the river.

In 2002, River Thames lifeboat crews responded to approximately 400 cases of attempted suicides and suicide victim recovery. Many of their cases were recovered from the 62.14 km stretch of the tidal Thames, which runs through the Boroughs of Central and Greater London, particularly between Eel Pie Island and Barking Point. Bodies deposited in this area of the Thames are subject to diverse and ever changing conditions, as the river alters from fresh water to a marine environment; both of these settings have a unique and specific effect on the movement and decomposition of these bodies.

A retrospective study was carried out on 103 closed case files from the Marine Support Unit, Thames division of the Metropolitan Police. Each body used in the study had been positively identified; information such as demographic data, date last seen, and date recovered were present. The remains (84 males and 19 females) were recovered between December 1988 to June 2004 between Richmond and Barking Point. The aim of this study was to form a decompositonal table based on taphonomic changes related to the Postmortem Submersion Interval (PMSI), thereby creating a more accurate form of assessing PMSI to aid the process of identification. Another objective of the study was to evaluate the drift trajectory of the remains recovered in order to assess the viability of a predictive drift model. Such a model would provide insight into the fluvial transportation of human remains and, therefore, could be used to predict recovery locations as well as point of entry into the tidal Thames. The preliminary results are presented here.

PMSI was calculated from dates taken from missing person's reports or witness statements of sightings of the individual either in or entering the Thames. The PMSI ranged from 0 to 333 days, with a mean of 20.2787±4.74911 days and a mode of 3 days.

Using data from the 103 individuals recovered, taphonomic tables were developed focusing on a total of 13 variables for decomposition. Photographs exhibiting a minimum of 50% of the body, along with postmortem examination and police reports, were used to assess decompositional changes. As a result of a multivariance analysis test (MANOVA), which indicated a statistically significant relationship (Λ= 0.048, sig'. 0.000) between the decompositional variables and the season in which the remains were removed from the Thames, the taphonomic tables were further divided into two seasons, winter (November-April) and summer (May-October). Further analysis of variables that may account for the observed decomposition is presently underway.

Of the 103 cases, 47 had known points of entry into the Thames provided by witness statements and emergency calls. Drift distance both nautical miles and kilometers was analyzed in order to determine if a drift trajectory model could be developed for this stretch of the Thames, and also to determine if set variables could aid in determining the location of where a body may have either entered the river or would be expected to be recovered. Drift was calculated by using standard distances developed by the Port of London Authority, with London Bridge as the point of reference. Negative drift, moving upstream from the point of entry, was observed in 4 cases. The mean drift was 3689.8511 meters ±1000.389 meters (1.9836 ± 0.54119 nautical miles), with the PMSI ranging from 0 to 270 days. Preliminary analysis of

 ** Presenting Author*

variables affecting drift through the use of Pearson correlation ($P<0.05$) indicates that demographic data such as sex, race, and physical build have no statistically significant correlation with drift distance. Analysis of PMSI indicates that there is also no statistically significant correlation between PMSI and drift ($r = -0.48$, $p = 0.747$). Investigation into tidal heights and upstream flow velocity is presently being conducted. Preliminary research has also led to the opinion that a predictive model is not applicable to this area of the tidal Thames due to complex micro and macro current systems, which can be altered through a multitude of environmental and industrial factors, such a sewage run off, upstream rain fall, or the presence of cargo, passenger, or pleasure boats.

Fluvial Transportation, Taphonomy, Aquatic Environment

 ** Presenting Author*