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Identification of Serial Homicide Victims in the “Green River Murder” Investigation

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ABSTRACT: The Green River Murder Investigation in King County, Washington, is currently the longest and most active serial murder investigation in U.S. history. To date, little information has been reported on methods used in identification of serial murder victims. In this paper, various methods used in victim identification are reviewed and difficulties encountered during the course of the investigation are described. The experience of the authors is presented in order to acquaint other agencies with problems of victim identification associated with these serial murder victims and to provide key methods that may be useful in other such investigations.

KEYWORDS: criminalistics, homicide, human identification

On 15 July 1982, children crossing the Peck Bridge spanning the Green River at the outskirts of the City of Kent, near Seattle, Washington, observed the body of a young woman in the water. On 12 Aug. 1982, downstream, a meat plant employee discovered a second young woman's body floating in a quiet pool of the river. Three additional bodies of young women were found in and on the banks of the river on 15 Aug. 1982. All five bodies had been discovered within one-half mile (0.8 km) of each other. All five had disappeared from the same general Seattle area and had connections with prostitution. Their discovery marked recognition by police of a serial homicide episode popularly termed the “Green River Murders.”

At the time of this writing, 29 additional victims have been recovered in the King County, Washington, area and their deaths have been attributed to the “Green River Killer,” bringing the total number of deaths under investigation from King County to 34. Two additional victims were recovered in the vicinity of Portland, Oregon, in 1985 and were identified from records on file as potential Green River victims. These two women have been added to the victim list, bringing the total number to 36. Thirty of the victims were discovered as partial to fully skeletonized remains. Table 1 provides information on the age, race, method of identification, dates of discovery and identification, and elapsed time from discovery to identification for each of the 36 victims. Figure 1 graphs victims in chronological order of discovery with elapsed time from date missing to discovery and from discovery to date identified indicated.

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TABLE 1—*Green River victims.*

Victim	Age/ Race ^a	Date Discovered	Method of ID	Discovery to ID	Missing to Discovery
1	16/wh	15 July 82	visual	4 days	7 days
2	23/wh	12 Aug. 82	fingerprints	4 days	18 days
3	17/bl	15 Aug. 82	dental	8 days	4 days
4	31/bl	15 Aug. 82	fingerprints	2 days	15 days
5	16/bl	15 Aug. 82	dental	8 days	3 days
6	17/wh	25 Sept. 82	dental	4 days	2 months
7	21/ai	8 May 83	dental	1 day	5 days
8	18/bl	11 Aug. 83	dental	14 months	10 months
9	24/mr	19 Sept. 83	X-rays/prints	23 months	5.5 months
10	19/wh	15 Oct. 83	dental	12 days	4.5 months
11	20/wh	27 Oct. 83	dental	6 days	4 months
12	32/wh	29 Oct. 83	dental	15 months	10 months
13	19/wh	13 Nov. 83	dental	1 day	2 months
14 ^b	16/wh	15 Dec. 83	dental	4 days	8 months
15	22/wh	14 Feb. 84	skull X-rays/ body X-rays	15 months	2.5 months
16	19/wh	13 March 84	dental	6 months/ 8 days	3 months
17	un	22 March 84	unidentified	NA ^c	NA
18	18/bl	22 March 84	dental	1 day	10 months
19	26/wh	31 March 84	dental	1 month/ 18 days	7 months
20	17/bl	1 April 84	dental	7 months	13 months
21	16/bl	1 April 84	dental	1 day	20 months
22	17/wh	1 April 84	dental	2 days	11.5 months
23	18/wh	18 April 84	dental	19 days	12 months
24	36/wh	18 April 84	dental	2 days	21 months
25	22/wh	20 April 84	dental	26 months	9 months
26	15/wh	26 May 84	dental	1 month	17 months
27	25/wh	12 Oct. 84	dental	1 day	12 months
28	18/mr	15 Nov. 84	dental	1 day	7 months
29	16/wh	10 March 85	dental	1 day	24 months
30 ^b	18/wh	12 June 85	dental	5 days	
31 ^b	23/bl	12 June 85	skull X-ray	5 days	
32	16/bl	9 Sept. 85	dental	2 days	19 months
33	un/bl	30 Dec. 85	unidentified	NA	NA
34	un/wh	30 Dec. 85	unidentified	NA	NA
35	19/wh	2 May 86	dental	1 day	31 months
36	19/wh	13 June 86	dental	2 days	32 months

^awh = Caucasian.

bl = Black.

ai = Asian.

mr = Mixed race.

un = Exact age undetermined.

^bBody discovered near Portland, OR.

^cNA = not available.

In February of 1984, a multijurisdictional police investigative commitment was begun with the establishment of a task force under the direction of the King County Police. Victim identification was assigned a high priority. Successful identifications were the result of the combined efforts of the "Green River Task Force" and the King County Medical Examiner's Office.

The main purpose of this report is to discuss difficulties encountered in the identification process and to comment on methods which proved most successful in identifying these serial murder victims. Individual case examples are analyzed, and general conclusions as to the

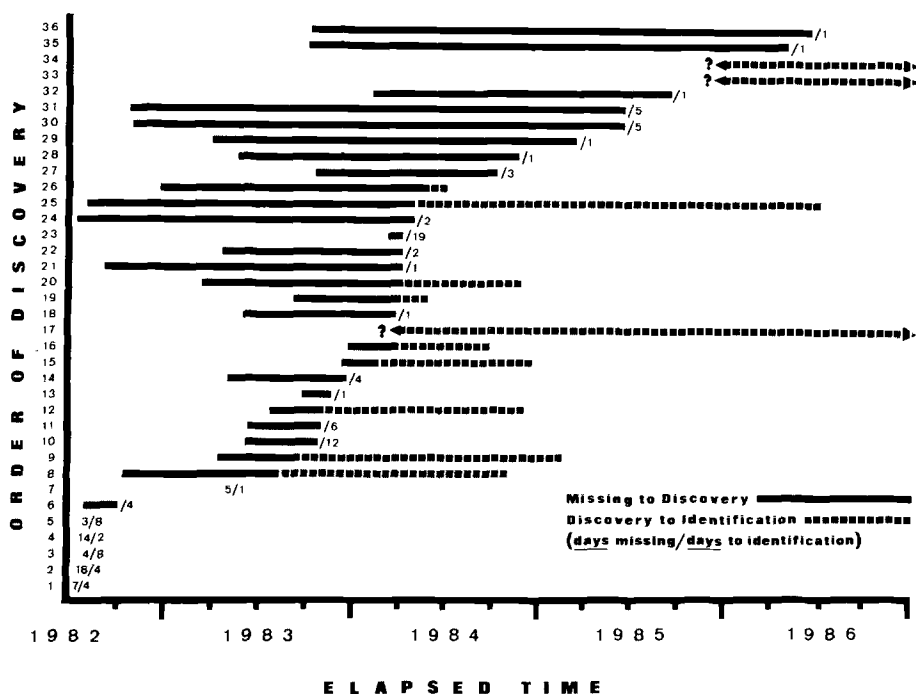


FIG. 1—Victims listed in chronological order of discovery. Time elapsed from date missing to date discovered as well as time from date discovered to date identified are shown.

usefulness of various methods are examined. Methods successful in establishing leads to identification are shown in Fig. 2. Actual methods used to confirm identifications are listed in Table 2. As shown, 75% of the victims were identified using dental X-rays, making this by far the most useful method of identity confirmation. To date, identification has been confirmed for 33 of the 36 victims, yielding an overall identification rate of 92%. In spite of this high degree of success in identification, particularly when compared with other serial homicide episodes of a similar nature, numerous problems were encountered in the identification process.

Six major sources of difficulty in the Green River victim identification process were (1) delay in discovery of bodies, (2) recovery and condition of remains, (3) age of victims, (4) lifestyle of victims, (5) their status as "missing persons," and (6) retrieval of antemortem dental and hospital records. These factors contributed to the difficulty of the identification process, increased the degree of effort needed to make an identification, and in many instances, lengthened the elapsed time from discovery to identification.

Delay in Discovery of Bodies

Although the initial 5 victims were found near or in the water of the Green River, the subsequent 31 victims were discovered in rural wooded areas off main highways or in urban and suburban areas on abandoned or infrequently used property with trees and dense overgrowth. Most of the discoveries were made when lush ground cover was at its minimum in fall, winter, and early spring. Also contributing to seasonal discoveries were activities such as mushroom and game hunting, which brought people to isolated locations. Table 3 lists the activities people were engaged in at the time they discovered bodies. As shown, police found

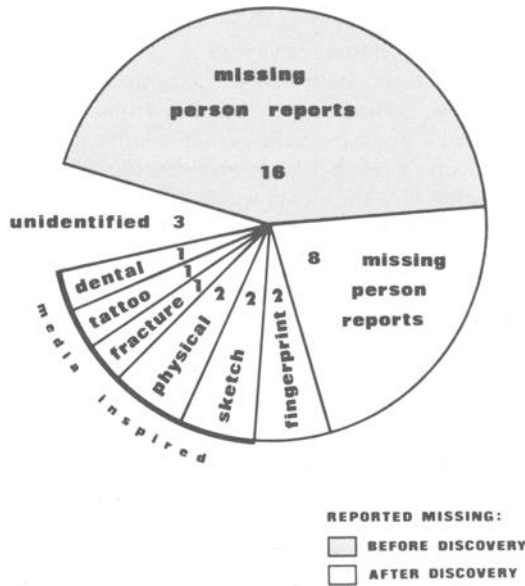


FIG. 2—Methods of establishing leads to successful identifications.

TABLE 2—Green River victims: methods of confirming identification.

Method	Number of Victims	Percent
Dental	27	75.5
Fingerprints	2	5.6
Skull/body X-rays	3	8.3
Visual	1	2.8
Unidentified	3	8.3
Total	36	100.0

TABLE 3—Activities of persons discovering victims.

Activity of Finder	Number of Bodies Found	Percent
Police while searching areas of previous body finds	10	27.7
Citizens	6	16.6
Hikers	3	8.3
Mushroom hunters	3	8.3
Hunters	3	8.3
Children	2	5.5
Dirt bikers	2	5.5
Moss hunters	2	5.5
Rafter	2	5.5
Loggers	2	5.5
Baseball park caretaker	1	2.7
Total	36	100

10 victims while conducting searches of areas where bodies had previously been found. This led to certain select sites yielding clusters of victims.

In all cases, estimates of time of death were made at the scene of discovery, with time estimates given wide margins. Difficulty in establishing a time of death in cases involving skeletonized remains proved a problem to the overall identification process because these estimates set the time limits for missing persons who were treated as possible victims. Once the victim was identified, the time the victim was last known to be alive was established. Elapsed time from disappearance to body discovery in 24 identified skeletons ranged from 2 months to 32 months, with an average undiscovered time of 10.5 months (Fig. 1). For each victim, elapsed time from date of discovery to date identified and elapsed time from date presumed to be missing to date of discovery are shown.

Recovery and Condition of Remains

Animal activity characterized by tooth marks, defleshing, skeletal disarticulation, and bone scattering was in evidence to varying degrees in many of the remains recovered. Not surprisingly, those remains in rural locations presented the greatest skeletal damage, as demonstrated by a wide degree of scattering, damage to discovered bones, and absence of many bony elements. Frequently the anthropological assessment of age and stature was jeopardized by destruction of cancellous ends of long bones and critical areas of the innominate bone such as the pubic symphysis and ischio-pubic ramus. Missing anterior teeth created difficulties in confirmation of some dental identifications.

Routine morphological methods were used to determine age and sex of victims [1-4]. During the investigation the limitations of using generic skeletal features, such as age, sex, and race, in relating to the general public, became apparent. Specific information, however slight, such as hair length and color, special dental features, and fractures, greatly increased the probability of generating leads to identification. This is illustrated by one case where the press made note of medium-length, blonde hair. The reference to hair color inspired a family to report a missing person and led to identification of a previously unidentified victim. Another victim was reported missing after a description of her dental work appeared in the media.

Portions of a single victim's remains were sometimes discovered at different times and locations. For example, a skull, absent the mandible, was discovered in December of 1983 along a roadside. Other skeletal elements were located in January 1986, approximately 150 yards (137 m) from where the skull was found. In another instance, a fragment of mandible was brought to the King County Medical Examiner's Office in 1984. The mandible had been found in a residential yard comingled with animal bones a dog had brought home, approximately one-quarter mile (0.4 km) from the discovery of a partial skeleton in January of 1986. The mandible was determined to belong to this partial skeleton.

Age of Victims

The age of identified victims ranged from 15 to 36 years with a mean age of 20 years and a median of 19 years. Age ranges and race of the identified victims are given in Table 4. As shown, the majority of victims were white and between 15 and 19 years of age. The youth of the victims contributed to difficulties in identification in two major ways. First, dental records when retrieved were frequently of mixed dentition, including both deciduous and permanent teeth, while the remains of victims contained only adult dentition. Second, police records of juveniles are handled differently from those of adults. For instance, juveniles may not be fingerprinted, and juvenile records may be purged once they reach 18 years of age. Further problems in the handling of missing persons are discussed below.

TABLE 4—*Demographic characteristics of identified victims.*

Demographic Characteristics	Number of Victims	Percent
Age:		
15-19	21	63.6
20-25	7	21.2
26-30	2	6.0
30-35	2	6.0
36	1	3.0
Total	33	
Race:		
White	21	61.8
Black	9	25.2
Asian	1	2.9
Mixed race	2	8.8
Total	33	

Victim Lifestyles

Unstructured lifestyles of the victims complicated the identification process. A hallmark of unstructured lifestyle is mobility with frequent change of residence. Several of the Green River victims were runaways, had been placed in foster homes or detention facilities, or had lived the "street life." Prostitution, which emerged as the most common lifestyle of the victims, has associated activities, such as drug use, which hinder police tracking and inquiry on victims. Mobility also implies loss of contact with parents, acquaintances, and medical/dental facilities. With this loss of contact, disappearances go unnoticed. In addition, multiple aliases and street names were used by many of the victims. At one time, records sought on 11 missing individuals involved checking 77 names. In another instance, records collected under 2 aliases were treated as separate individuals, and it was not known for some time that they were the same person. It was not uncommon for several persons to use the same alias or the name of another person.

Missing Persons Records

Traditionally, missing persons are intensively investigated by police agencies only when a known kidnapping or other foul play is involved. For most agencies, time, funding, and manpower are not sufficient to begin to process adequately missing individuals falling outside these two categories. Acceptance, retention, followup, and purging of missing persons varies not only from agency to agency, but even within agencies. Locally, with approximately 30 separate police jurisdictions affected by the Green River investigation, 4 situations were noted:

- Some jurisdictions required missing persons to have resided within the province of their jurisdiction, while others required the missing individuals to have disappeared from their jurisdiction.
- Many jurisdictions insisted that Missing Persons Reports be made by family members, while others accepted such reports from friends or acquaintances.
- Reports on missing adults were frequently processed, retained, and followed up in a manner different from that for missing juveniles.
- Many victims were "recurrent missings."

In the case of recurrent missings police sometimes assume the person will return again and, therefore, he/she is not treated as a true missing. In one instance, a missing person mistakenly reported to be "located" and alive by a police agency in Texas was later confirmed as a Green River victim. There were also instances where files were closed on persons who had been made a ward of the court without verification of their whereabouts; hence, it was not known if they were missing. Only a thorough knowledge of how missing persons are handled by different police agencies gives some assurance of avoiding pitfalls which might prevent identification of a victim.

Missing persons files are not solely the responsibility of police. Many missing persons are not reported or their absence is not closely monitored by friends or relatives. It was not uncommon for Green River victims to be "out of touch" for long periods of time and, hence, natural for them not to be considered missing. These "missing persons" would not be reported by relatives or acquaintances during these lapses of contact. This was a consequence of their lifestyle as "street people" or having connections with prostitution or both.

Other specific problems in the Green River investigation included the public perception of Green River victims as prostitutes and the stigma attached to prostitution. Some families of unreported missing persons were reluctant to admit that their daughter might be connected with this lifestyle. Some felt that reporting a missing person was an admission that the individual was dead and implied a loss of hope. Other families were reluctant to deal with the police and found that dealing with a neutral agency such as a crisis clinic, missing persons group, or the Medical Examiner's Office was preferable. In some instances the family had lost contact and did not know the individual was truly missing. Families often waited for a "magic date," such as a parent's birthday, a holiday, or some other date the victim usually contacted them, before they reported a person missing. Other families were confused because they thought that initial contact with the police had constituted a formal report. Still others assumed that another member of the family had made the report.

Record Retrieval

Difficulties in obtaining accurate or complete dental or health records were encountered because of (1) the young age of the victims, which was associated with mixed dentition; (2) the unstructured lifestyles, resulting in lack of familiarity of families and associates with dental and other health history; and (3) incomplete or poor quality of available records. Recourse was made to family and friends, past employers, welfare agencies, and insurance providers to locate health and dental records. Once common record sources were exhausted, general inquiries were directed to local community clinics and hospitals known to provide free or low-income care. Adult and juvenile detention facilities were a fertile source of dental records.

The majority of records were obtained by Green River Task Force detectives who routinely collected them as a part of their followup on missing persons determined to be possible victims. In a few cases, this involved locating dentists who had retired and moved from the area. In only one instance were records known to have been destroyed by a health care institution. All copies of dental records of missing persons have been retained on file at the Medical Examiner's Office and continue to serve as a valuable resource to future identification.

Typical Case Identification

Victim 9 (Table 1) illustrates many of the difficulties encountered in making an identification. Her partially skeletonized remains were found by hikers on 19 Sept. 1983, in a hilly, wooded area approximately 70 ft (21 m) from a roadway. The lower extremities, fingertips, and back had parchment-like skin attached. Long black hair was recovered with the remains.

At the time of autopsy, no trauma was noted nor was there evidence of previous fractures or other pathology observed in postmortem radiographs. The cause of death was attributed to "homicidal violence of undetermined origin." One partial right middle fingerprint was obtained. Assessment by a physical anthropologist concluded the remains were those of a 15-to-25-year-old female, 5 ft to 5 ft-6 in. (150 to 165 cm) in height, with mixed racial characteristics, most probably Caucasian and American Indian. Comparison of postmortem dental X-rays and charts with dental records on file failed to yield an identity, so the descriptive information mentioned above was released to the media. No leads resulted. The partial fingerprint was compared with fingerprints of missing young women on file, but no match was obtained.

A "facial reconstruction" was completed in November of 1983. Interestingly, the technician who did this first "reconstruction" interpreted the mixed racial features as being Japanese. Photographs of this reconstruction were shown by plain-clothes detectives on the streets. A second reconstruction on this victim, which received extensive media coverage, was completed in June of 1984. No leads were generated. Meanwhile, dental charts were published in both state and county dental journals. Dental and physical descriptions were also placed on the National Crime Information Center (NCIC), Canadian Police Information Center (CPIC), Washington State Information Center (WASIC), and California Criminal Justice System computers.

In December of 1984, the opinion of one of the present authors (C.C.S.), a physical anthropologist who specializes in forensic science investigation, was sought. A major contribution of this examination was discovery of a well-healed, left ischiopubic ramus fracture previously not noted. It appeared that a fracture of this type would have resulted from a major impact requiring hospitalization. A newspaper article containing this information was published on 5 Feb. 1985. The following day, the victim's aunt notified investigators of a missing niece who had suffered a fractured hip in a boating accident.

Recovery of hospital X-rays confirmed this identification, which was completed 22 Feb. 1985. A comparison of the partial fingerprint with available records corroborated the identification.

Discussion

Although the Green River investigation has had unique problems, successful identifications were aided by several factors, some of which are transferable to other investigations. These included: (1) creation of a dental/medical records file; (2) task force commitment with special emphasis on intensive police followup of missing women matching the victim profile; (3) consultation with experts in related forensic fields; (4) community, professional, and news media cooperation; and (5) cooperation between police and the Medical Examiner.

The dental/medical file and task force commitment deserve special comment. Most significant to successful identification was the creation of a dental/medical records file based on intensive screening of records from missing women. Testament to the excellent screening done by task force detectives was the fact that in many instances, records were available months before the remains were discovered. This anticipation of victims often led to immediate identification once the victim's remains were found. A continuous effort, sometimes over periods of months, was necessary to locate and gather sufficient records to insure and confirm identification of some of these victims. In addition to the 33 Green River related cases identified from these files, 6 other unidentified bodies, 5 from Washington State and 1 from Montana, were identified.

A technique most helpful for accurate record comparison was for postmortem dental films to duplicate angulation of antemortem records. This allowed accurate comparison of dental characteristics and became critical in those instances of limited or poor quality antemortem records. In those identifications dependent on fine morphological characteristics of tooth

and bone morphology, the availability of original radiographic material rather than copies was critical.

Utilization of the skills of a forensic anthropologist can also be critical in generating information leading to identification. Although a physical anthropologist's skills are generally sufficient for examination of skeletal material, the observations of a forensic science specialist is sometimes invaluable.

We found institutions and individual dentists and health care providers most generous in their support of our efforts. The local dental society assisted in charting dental record files into computer forms.

Victim data were placed on computer systems including NCIC, CPIC, California Criminal Justice System, and WACIC. Unfortunately, use of such systems did not generate successful identification of any victims. The success or failure of all such computer systems is dependent upon (1) missing persons being reported, (2) timely entry into the system, and (3) removal from the system once the missing person is located [5]. Another problem in many locations is that compliance with statutory requirements for retrieval of missing persons' dental records often cannot be enforced.

Other techniques were used to generate possible leads to identities. Among these was publishing dental charts and descriptions of remains in periodicals of state and local dental societies. Facial reconstructions were done in six instances, and facial profile sketches deduced from lateral skull X-rays were accomplished in three instances. Although these efforts proved unsuccessful in this particular investigation, they should be considered when conventional efforts fail. The main use of reconstruction was considerable media appeal, which provided a forum for drawing public attention to the identification difficulties.

Conclusion

The Green River Investigation is currently the longest running serial murder investigation in U.S. history. Little has been reported on methods of identification of serial murder victims. Although each serial homicide investigation has idiosyncrasies particular to that case, it is hoped that our experiences will be of value to other investigators.

Note

A 37th victim attributed to the Green River Killer was discovered on 27 June 1987. She was a 17-year-old Caucasian who had disappeared in March of 1984. Identification was accomplished within 1 day of the discovery by body X-rays on file at the King County Medical Examiner's Office.

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