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PERSPECTIVE



A Brief History and Perspective on Spirit Cave, Nevada

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ABSTRACT

In 1940, Sydney and Georgia Wheeler recovered a remarkable assemblage of human remains and associated funerary objects in a small alcove they named Spirit Cave. Located in western Nevada, the significance of Spirit Cave's human burials would not become known until the 1990s when the Nevada State Museum dated the remains to ca. 10,500 calendar years BP. The 1990s also marked the passage of the Native American Graves Protection and Repatriation Act, as well as the discovery of the ancient Kennewick Man skeleton. Both Spirit Cave and Kennewick sparked lawsuits and bitter debate among the scientific community, tribal communities, and various branches of the federal government over who should own and control what happens to these ancient remains. This perspective provides a synopsis of the history of the Spirit Cave case, and provides insight into the primary factor that ultimately led to its resolution: DNA.

KEYWORDS

Spirit Cave; NAGPRA;
Kennewick Man; ancient DNA

August 11, 1940 – Since coming to camp, when going to the Fish Cave, we had noticed a slit in the hill about a mile east of the road [...]. It proved to be a shelter from which a short passage led to a small room to the north [...]. GNW [Georgia N. Wheeler] put down a small test pit near the rear wall [...]. At a depth of 1.0 foot, she uncovered a fragment of a finely woven (twined) mat of tule or cat-tail. This contained BURIAL #1 [...]. Under BURIAL #1, at a depth of 2.3 feet, she uncovered BURIAL #2 [...]. This ended the first day's work at SPIRIT CAVE. (Wheeler 1940, 15)

August 13, 1940 – Spent most of the day working on BURIAL #2 from Spirit Cave [...]. Upper portion of body is partially mummified. Leather mocassins [*sic*] on the feet. Scalp and some hair on the head. The hair was black when uncovered but rapidly changed to red-dish on exposure to the light and air. Body was laid on a fur blanket. Finely woven twined mat of tule or cat-tail was wrapped around upper portion and stitched to form a bag over the head. A second similar mat was wrapped around the lower portion. The mats overlapped. An open twined mat was placed over the whole bundle and the lower corners tied together under the feet. (Wheeler 1940, 16)

In a small alcove along a rocky outcropping in the sage steppe of the Great Basin Desert, the saga of the oldest partially mummified skeleton ever found in the western hemisphere began. In 1940, Georgia and Sydney Wheeler discovered the remains during salvage excavations for the Nevada State Parks Commission, while surveying areas for sites in Churchill County that were being damaged by looting and lost due to guano mining. Shortly after excavation, the “Spirit Cave Mummy,”

known by S. M. Wheeler as “Burial #2,” was displayed at the Nevada State Fair in Fallon for the summer, and was then moved to Carson City and curated at the Nevada State Museum for more than 50 years before its scientific importance became known. At the time, both S. M. Wheeler and M. R. Harrington (then curator at the Southwest Museum) agreed that Burial #2 was approximately 1500–2000 years old (Wheeler 1943, 3; Wheeler and Wheeler 1969, 74). Between 1994 and 1996, the late Donald Tuohy (then Curator of Anthropology at the Nevada State Museum) and Amy Dansie (retired anthropologist, Nevada State Museum) submitted textile and hair samples from Spirit Cave for radiocarbon dating. The results were rather stunning: the burials and textiles that the Wheelers recovered less than a meter below the surface of Spirit Cave were approximately 10,500 calendar years old (ca. 9350 ¹⁴C yr BP) (Dansie 1997).

The decade of the 1990s also began with the passage of the Native American Graves Protection and Repatriation Act, or NAGPRA, on 16 November 1990 (25 U.S.C. 3003 et seq.). The statute and implementing regulations require federal agencies and museums that receive federal funding to review their collections for Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony (cultural items), consult with Indian tribes, and determine based on available evidence if the remains and/or cultural items can be attributed by name to a lineal descendant or “culturally affiliated” with an Indian tribe. For prehistoric Native

American human remains, a known lineal descendant is not possible. But, if the human remains and cultural items were determined to be culturally affiliated with an Indian tribe, then the federal agency or museum that owned them was required to repatriate them to the appropriate tribe (25 U.S.C. 3005; 43 CFR 10.10) under Section 7 of the NAGPRA.

Throughout the 1990s, the Nevada State Museum assessed the status of all the human remains and associated funerary objects in its collections, including those from Spirit Cave. Spirit Cave is located on federal lands managed by the U.S. Department of the Interior, Bureau of Land Management (BLM). The BLM Nevada State Director is the official who ultimately decides the fate of human remains and objects subject to NAGPRA that were removed from BLM public lands in Nevada prior to 16 November 1990. This decision is based on an evaluation of the available evidence, as prescribed in the NAGPRA regulations. The Nevada State Museum provided the BLM, Nevada State Office (BLM Nevada) with its recommendations on the cultural affiliation of dozens of individual human remains and funerary objects between 1997 and 1998. Those that were determined to be culturally affiliated were repatriated to various tribes, mainly Northern Paiute tribes who currently reside in western Nevada where most of these human remains and objects were recovered in the early to middle twentieth century. Those that were determined to be culturally unidentifiable (no lineal descendant or culturally affiliated Indian tribe could be identified) remained in the museum, as NAGPRA had no requirement to either repatriate or transfer ownership under these circumstances until 2010 when regulations were issued that provide options for disposition of culturally unidentifiable human remains in 43 CFR 10.11.

In 1996, given Spirit Cave's great antiquity and scientific importance, as well as to assist in making its recommendation to BLM Nevada concerning cultural affiliation for NAGPRA, the Nevada State Museum requested that BLM Nevada authorize DNA analysis on the Burial #2 skeleton. BLM Nevada consulted with local Indian tribes, who were unanimous in their opposition to DNA studies. The Fallon Paiute-Shoshone Tribe (FPST), headquartered in Fallon, Nevada near Spirit Cave, claimed affiliation with the Spirit Cave human remains and requested immediate repatriation.

The Kennewick Man skeleton was also found in 1996 (Chatters 2000a). However, the fates of Kennewick and Spirit would ultimately take very different pathways over the next two decades. By 1997, a series of papers on the scientific investigation of the Spirit Cave Burial #2 skeleton (minus DNA) was published by the *Nevada Historical Society Quarterly* (e.g. Edgar 1997; Eiselt 1997;

Napton 1997; Tuohy and Dansie 1997). These studies determined that the Burial #2 individual was a male between the ages of 40 and 50 years at the time of death. He showed few signs of osteoarthritis in the joints of his appendages, but he was born with an extra thoracic vertebra, giving him 13 instead of the typical 12. This individual suffered a fracture to the frontal bone of his skull, which had completely healed before he died. Three badly abscessed teeth likely led to his death. Coprolites were preserved in the individual's intestines, and they revealed that his final meals consisted of two species of fish and bulrush (*Scirpus*) seeds, consistent with the marsh-side location of Spirit Cave.

By 1999, a facial reconstruction of Spirit Cave's Burial #2 cranium made the cover of *Newsweek* magazine (Begley and Murr 1999). Kennewick Man, too, had an early facial reconstruction (Chatters 2000b). That effort fostered speculation about the possible European origin of Kennewick Man, which quickly fueled a media frenzy following publication by the *New York Post* of a side-by-side comparison of a photo of the Star Trek actor Patrick Stewart and the facial reconstruction of Kennewick Man (e.g. Thomas 2001, xxv). Spirit's facial reconstruction, too, appeared un-Native American like, fueling further speculation that both Kennewick and Spirit were not Native Americans. This also led to the argument that NAGPRA did not apply to ancient human remains. For an interesting glimpse of the changing face of Kennewick Man over the past two decades, compare Chatters (2000b) to the cover of *Time* magazine (2006), and most recently to Preston (2014) in *Smithsonian* magazine.

Richard Jantz and Douglas Owsley studied the cranium of Spirit Cave Burial #2 shortly after its age became known, and published their preliminary findings as early as 1997 (Jantz and Owsley 1997). Jantz and Owsley (1997), relying on morphometric analysis of the cranium stated:

The cranial measurements can be used to assess group identification and trace ancestral/descendent relationships through morphometric comparisons using multivariate, biological distance statistics. Craniofacial morphology is strongly determined by the genetic makeup of the individual, and groups that are closely related through common ancestry share similar features and dimensions. (p. 62)

It is not the purpose of this paper to debate the validity of these statements. In the case of Spirit Cave, the primary questions as they relate to the use of morphometric data in the application of NAGPRA and federal agencies determining matters of Native American status and cultural affiliation under that law are these: Is evidence from DNA a better indicator of Native American status under

NAGPRA than morphometric analysis? Alternatively, are the two data sets of equal value for defining the meaning of “Native American” under NAGPRA? Importantly, these questions are not necessarily synonymous with asking: “Are DNA and morphometrics equally valid for determining groups that share common ancestry?”

As we discuss in further detail below, morphometric analysis suggested that both Spirit Cave and Kennewick Man shared a common ancestry with populations in Asia, and hence both individuals possessed a number of these shared morphometric traits at the time of their deaths. Some of these shared traits are no longer expressed in modern Native Americans. Hence, early Native Americans and their ancestral populations in Asia share specific morphometric traits not seen in modern Native American populations. However, independent DNA analysis indicates that Spirit Cave and Kennewick Man are genetically Native American in that they share genetic traits with modern Native Americans that are not shared by their morphometric brethren located in the Old World. Put another way, morphometric analysis may be a valid method for investigating human populations that once shared a common ancestry but are now isolated from one another due to migration or other factors. But the simple fact that the two populations once shared common ancestry thousands of years ago does not mean that the migrating group should be considered singularly related to that ancestral group over the human populations they would give rise to in their new homeland.

In the application of NAGPRA, asking which types of data are most important to the determination of Native American status is of paramount importance because if a set of human remains does not meet the definition of “Native American” under NAGPRA, then NAGPRA simply does not apply to them – period. NAGPRA required that the BLM Nevada State Director make two primary determinations: (1) Do the Spirit Cave human remains meet the definition of Native American under the law? and (2) If so, then are the remains culturally affiliated with a modern Indian tribe or culturally unidentifiable? Federal agencies cannot get to the second question without first affirming that the remains meet the definition of Native American under NAGPRA. However, the statutory and regulatory direction in NAGPRA focuses more on an evaluation of evidence to determine cultural affiliation. The authority is rather quiet on thresholds to determine if remains are Native American.

Jantz and Owsley (1997, 79–81) published interpretations of Burial #2 from Spirit Cave concerning ancestral–descendent relationships based on morphometrics that echo some of the primary arguments used against

the federal government in the Kennewick Man court case (see also Owsley and Jantz 2014). These include: (1) the skulls “[...] fall outside of the range of variation of any modern population represented by currently available samples” (Jantz and Owsley 1997, 79); and (2) “In the general analysis, the vault profile, facial forwardness and prognathism components dominate, resulting in Norse and Ainu as the two populations to which Spirit Cave is most similar” (Jantz and Owsley 1997, 81).

The National Park Service provided a definition of Native American as any human remains dating prior to 1492 during the Kennewick Man court case proceedings (Stapp 2008, 51). However, the deep age of the Kennewick skeleton and interpretations based on morphometrics described above were enough for Magistrate John Jelderks to conclude in 2002 that the federal government had not demonstrated that the Kennewick skeleton met the definition of Native American under NAGPRA. As a result, NAGPRA did not apply to its management (e.g. Stapp 2008). At that moment, the management of the Kennewick skeleton ceased to be under the purview of NAGPRA, and the federal government would instead manage the skeleton as any other archaeological resource curated in a museum meeting federal curation standards (36 CFR 79).

Although the Spirit Cave and Kennewick Man cases were similar with respect to how physical anthropologists interpreted their ancestral–descendent relationships through morphometric analysis, Spirit Cave took a very different pathway through the court system, and, ultimately, resolution of the case. The federal government concluded that Kennewick Man was Native American and intended to transfer custody of the skeleton to the Umatilla tribe; a group of scientists sued the federal government, and, as noted above, prevailed in court, convincing the court that Kennewick did not meet the definition of Native American under NAGPRA. The remains were maintained as a federal collection, available for research and subject to many studies for the next 13 years.

No DNA evidence was available during the Kennewick Man court case. However, 13 years later DNA analysis revealed Kennewick’s genetic Native American status (Rasmussen et al. 2015). DNA analysis of Kennewick Man ultimately led to resolution of this case. Publication of the results of DNA analysis (Rasmussen et al. 2015) was followed by congressional passage of sponsored legislation (S. 1979 and H.R. 4131) included in the Water Infrastructure Improvements Act for the Nation (Public Law 144–322) signed by President Obama on 16 December 2016. Section 1122 of the Act directed the Army Corps of Engineers to transfer control

of the skeleton to the Washington State Department of Archaeology and Historic Preservation, who would then transfer the skeleton to the original claimant tribes. On 17 February 2017, the Kennewick skeleton was returned to the Confederated Tribes of the Colville Reservation, the Confederated Tribes and Bands of the Yakama Nation, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Wanapum Band of Priest Rapids. Kennewick Man was never resolved through the NAGPRA process.

BLM Nevada also concluded that Burial #2 from Spirit Cave was Native American in 2000 – but culturally unidentifiable (Barker, Ellis, and Damadio 2000), and therefore was not required to transfer the remains to a tribe. However, the FPST claimed affiliation and sued the federal government. Why did the FPST sue BLM and why did scientists not sue the BLM over the Spirit Cave case? Because prior to 2010, there was no direction in NAGPRA that addressed disposition of culturally unidentifiable human remains. In other words, if BLM Nevada determined that the Spirit Cave human remains were culturally unidentifiable, even if the skeleton was determined to be Native American, then there was no requirement to transfer ownership. With that knowledge, there was no reason for a group of scientists to sue the BLM as had been done in the Kennewick case because the BLM decided that Spirit would remain curated in a museum.

The FPST disputed BLM's determinations. The tribe first took their dispute to the NAGPRA Review Committee in 2001. By a 6-1 vote, the NAGPRA Review Committee "determined that BLM had failed to fairly and objectively consider all the available and relevant information" (National Park Service 2001) and that Spirit Cave Burial #2 should be determined affiliated with the Northern Paiute. The FPST sought another determination from BLM Nevada based on the Review Committee's findings, but BLM Nevada did not change its decision. The tribe sought a reversal of BLM Nevada's decision from the Secretary of the Interior and the BLM Director in Washington, DC. BLM did not change its decision. In 2004, FPST sued the BLM in Federal court.

On 21 September 2006, the Court, ruling for the FPST on cross motions for summary judgment, found that BLM's determination was "arbitrary and capricious," insofar as the BLM did not consider new materials presented by the FPST to the NAGPRA Review Committee or consider the recommended findings of the Committee itself. The Court did not find that BLM's initial determination was wrong or suggest that BLM make a determination of "affiliated" with a tribe. The Court simply ruled that BLM must adequately weigh all evidence available,

and justify why one theory or set of evidence should be chosen over another.

The BLM then spent the next two years contracting with several scientists to provide "fresh reviews" and perspectives of the evidence for or against cultural affiliation (Goodman and Martin 2009; McDonald 2009; Simms 2009), and an additional six years internally discussing a path forward to resolution. There were several paths: Native American or not; culturally affiliated with the FPST or culturally unidentifiable; if culturally unidentifiable, offer to transfer to FPST under the new Section (10.11) added to NAGPRA in 2010. No clear path forward materialized that did not have a high risk of another lawsuit, by either a tribe or scientists. It was as if the case had been tacked to a wheel that was perpetually in motion, spinning but never moving.

BLM Nevada re-engaged the FPST directly in 2013. Importantly, new DNA evidence on late Pleistocene human skeletons rapidly emerged in 2014 and 2015 (Chatters et al. 2014; Raghavan et al. 2013, 2015; Rasmussen et al. 2014, 2015), and together with earlier DNA evidence (e.g. Kemp et al. 2007) a clearer picture developed that suggested all of these early skeletons could be considered genetically Native American. This appeared to contrast with the interpretations based on cranial morphometrics used in the Kennewick court case. How is this possible? BLM Nevada became convinced that the earliest Native Americans had developed specific DNA signatures that linked all known late Pleistocene-aged skeletons with modern Native Americans, and that these subtle changes had occurred prior to significant changes in cranial features from their parent population(s) in Asia. As a result, BLM Nevada concluded that on the matter of the definition of "Native American" under NAGPRA, evidence from DNA trumped evidence from morphometrics. Here, then, was the answer the BLM was seeking. The only piece of evidence not at its disposal was DNA. DNA seemed to be the missing puzzle piece to the question: "Was the Spirit Cave Burial #2 skeleton a Native American under NAGPRA?"

BLM intended to reach out to Eske Willerslev with the University of Copenhagen to gauge his interest in completing the DNA analysis, and serendipitously Willerslev sent an email to BLM Nevada in late 2014 expressing an interest in completing DNA analysis on Spirit Cave's Burial #2. BLM Nevada informed the FPST in early 2015 of its intention to authorize DNA analysis on the Spirit Cave human remains to resolve the case. The FPST threatened to sue BLM over the DNA testing.

Willerslev travelled to Fallon, Nevada, and met with the FPST without the BLM in attendance. BLM was not required to seek the tribe's "approval" prior to

authorizing the analysis. If Willerslev did not agree to the DNA testing, BLM Nevada was prepared to reach out to other geneticists. This latter possibility, however, became unnecessary because the FPST were impressed with Willerslev's sincerity and empathy with the issues, which helped lead to the signing of a "Terms of Agreement" between the BLM and FPST. The terms essentially stated that the FPST were against DNA testing but they agreed not to file suit if BLM Nevada agreed to resolve the case expeditiously following the initial DNA results. This was negotiated compromise, and it finally stopped the perpetual spinning wheel, at least temporarily.

In September 2015, BLM Nevada also signed a Memorandum of Understanding (MOU) with Willerslev to complete the DNA analysis. Among other items, the MOU agreed that Willerslev was free to publish the results of the DNA analysis at a time and place of his own choosing, and that the BLM was free to use the initial results to resolve the case. The initial results would become part of the official federal government administrative record, and, as such, was available to public inspection if so requested under the Freedom of Information Act (FOIA).

BLM received Willerslev's preliminary findings in January 2016. On the matter of Native American status, his DNA results "[...] suggest that Spirit Cave remains are effectively more closely related to Native Americans than they are to any other population in the Old World" (Willerslev 2016). Willerslev's preliminary results, however, did not shed light on the matter of cultural affiliation.

With the DNA evidence in hand, BLM Nevada resolved to move quickly to publish final determinations in the Federal Register, as required by NAGPRA, for a 30-day appeal. Any member of the public, organization, or tribe would have the right of appeal of the BLM's determinations during the appeal period. Taking into consideration all the available evidence including the NAGPRA Review Committee's recommendations, BLM Nevada determined that the Spirit Cave human remains and associated funerary objects were Native American, thus NAGPRA applied to them, that the remains were culturally unidentifiable (affirming the initial determination in 2000), and that the BLM would transfer control to the FPST under the NAGPRA regulations, 43 CFR 10.11, governing disposition of culturally unidentifiable human remains.

The case, however, was placed back on the spinning wheel of non-resolution before the Federal Register Notice of Inventory Completion was published. BLM Nevada's draft determinations would undergo further review by the solicitors appointed in the Secretary of Interior's Office in Washington, DC. For the next eight

months, BLM Nevada discussed with Interior's solicitors the rationale behind affirming BLM's initial determination of culturally unidentifiable in 2000. As mentioned above, the FPST desired the BLM to determine the remains were "affiliated"; this caught the attention of Interior's solicitors who repeatedly questioned why BLM Nevada could not reach this determination on behalf of the tribe's request. Space here does not allow for a disclosure of how BLM Nevada weighed all the evidence, but this analysis and determinations are memorialized in a 31-page Memorandum that is part of the Spirit Cave administrative record (Ruhs 2016).

The BLM Nevada State Director, however, remained the authorized officer ultimately responsible for the Spirit Cave NAGPRA determinations. In October 2016, BLM Nevada proceeded with its final determinations of "Native American" and "culturally unidentifiable" by publishing a Notice of Inventory Completion in the Federal Register on 18 October 2016. BLM received two inquiries during the appeal period. Both inquiries requested the preliminary DNA results. As mentioned above, under FOIA, the public had a legal right to this document, and thus the document was provided. After 20 years of consulting, discussing, debating, and answering to courts, BLM needed to be transparent in its determinations.

BLM Nevada waited for 30 days. No appeal was submitted. No lawsuit was filed. The DNA evidence supporting Native American was convincing, so there was limited risk of plaintiffs representing scientific interests filing suit. The tribe had been consulted on the BLM's methodology and decision-making process, and was aware of the BLM's intent to transfer control, reducing the likelihood of the tribe initiating a new lawsuit.

DNA analysis should not be necessary for determining "Native American" in all cases; however, in the contested environment over ancient remains, DNA analysis has proved to be extremely valuable in determining when NAGPRA applies to human remains. To the question of whether evidence from DNA is a better indicator of Native American status under NAGPRA than morphometric analysis, the resolution of Spirit Cave and that of Kennewick Man indicate that, yes, DNA analysis is more informative. Continuing DNA research on ancient skeletal remains in North America corroborates this interpretation (Lindo et al. 2017).

On the 31st day, following publication of the Notice of Inventory Completion in the Federal Register, and the 30-day appeal period concluded, on 18 November 2016, the BLM Nevada State Director and the Chairman of the FPST signed the transfer of control document, transferring official ownership of the Spirit Cave human remains and associated funerary objects to the

FPST. Several days later, the FPST picked up the human remains and funerary objects and returned with them to their tribal headquarters in Fallon, Nevada. Thus, the two-decade long case of Spirit Cave was resolved through the NAGPRA process. BLM Nevada intends to permanently preserve the Spirit Cave administrative record in the National Archives.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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