

There are additional problems with the craniometric analyses. In a recent paper, which Goodman and Martin attached to their report, Professor Goodman evaluated the four published attempts to verify the use of craniometric techniques for identifying Native Americans and found that, on average, even contemporary Native Americans were correctly identified as such only about *one time in three*, a result that "is no better than random assignment." AAR 0989, 1003-1008, 1898. Moreover, the particular data base used by Jantz and Owsley for their study was flawed, since the "Numic" sample comprised only 22 skulls, with no indication of the number of males and no mention of cultural practices in infant and child rearing that would affect cranial size and shape, and since there were no additional Native American samples from the Southwest or Great Basin. *Id* at 0990, 1898-1899. On these and other grounds, Goodman and Martin concluded the craniometric data "are irrelevant to the question of cultural affiliation." *Id* at 0990, 1899.¹⁰

BLM's discussion of the craniometric data makes no mention of Goodman and Martin's analysis. Instead, it begins with "an assumption that those populations displaying the most similarities, or affinity, [in cranial measurements] are most closely biologically related. That is, groups that are closely related tend to share similar features and dimensions (measurements)." AAR 2017. Even with this assumption, the craniometric evidence presented by BLM is thoroughly inconclusive:

¹⁰ It should also be noted that the "science" of cranial measurements traces its history to the pre-civil war era, when Dr. Samuel Morton, the father of American anthropology, collected large numbers of Indian crania with the goal of proving, through skull measurements, that the American Indian was a racially inferior "savage" naturally doomed to extinction. AAR 1693. This history was an important factor that led to the enactment of NAGPRA, *id.*, and helps explain the Tribe's sensitivity to such analyses.

-- BLM cites several studies for the proposition that most ancient remains do not resemble each other, but then notes a study by Ozolins, which included Spirit Cave and other Paleo-Indian remains and concluded the amount of variation “is not greater than what would be expected for three individuals drawn at random from a single population.” AAR 2017-2018; *see also* note 11 below.

-- Likewise, BLM cites a number of studies, including the Jantz and Owsley study, for the proposition that most ancient remains do not resemble contemporary Native Americans, but then states “[a] prevalent view,” as summarized by Steele and Powell, is that “we are unsure of the cause of these differences.” They may result from different colonizing populations, or may “reflect an adaptation of later populations to a different environment or lifestyle, possibly associated with the origins of agriculture, and that these adaptations were accomplished by the general plasticity of a common genome.” *Id.* at 2017; *see also* note 11 below.

-- Finally, BLM cites a study by Gill of the Spirit Cave remains, who, unlike Jantz and Owsley, found “a *mixture* of ‘typical Amerindian’ and ‘traits that are basically Caucasoid’ with a ‘generalized Caucasoid’ trait constellation.” *Id.* at 2019 (emphasis added).

BLM concludes from the cranial studies that the Spirit Cave remains “do[] not appear to resemble any contemporary American Indian population,” and that the studies “do[] not allow the assignment of [the remains] to an affiliation with a particular tribe.” *Id.* BLM does not present the conclusion, supported by the Goodman and Martin’s report and the very studies it cites, that the cranial studies also fail to support the conclusion that the remains are *not* affiliated with any contemporary tribe, *i.e.*, that they are irrelevant to the question of cultural affiliation.

Biology – Dental Morphology. Several scientists have examined the teeth of the Spirit Cave remains. *See* AAR 0990. The reliable recording of dental traits requires a great deal of training and practice, and the number of skeletal biologists so trained is relatively small. *Id.* at 1900. However, unlike cranial metrics, dental traits such as cusp patterns have long been shown to be under strong genetic control, and thus offer greater genetic precision. *Id.* at 1900-1901.

Professors Goodman and Martin reviewed the Spirit Cave notes of Heather Joy Hecht Edgar, and data collection sheets compiled by Christy Turner II and Joseph Powell, and themselves measured all teeth possible and evaluated them for discrete trait variation. AAR 0990. Powell is an expert in the biology of early Americans, and Turner is the world's leading authority on dental discrete trait genetics. *Id.* at 0984, 0992.

Turner has identified a common dental pattern in Native North Americans and Northeastern Asians, which he named Sinodonty. *Id.* at 0990-0992. Although study of the teeth of the Spirit Cave remains is restricted because they are severely worn, *id.* at 0990, based on their review of Edgar's, Turner's and Powell's notes and their own examination, Professors Goodman and Martin made the following observations:

- the presence of severe shoveling on lateral incisors and shoveling on a canine *strongly* suggests affiliation with contemporary Native Americans, since shoveling in its advanced form is hardly ever found in any group except Native Americans and Northeast Asian populations, in which it is common, and shoveling on a canine is so rare in groups other than Native Americans and Northern Asians that it is seldom recorded;
- the presence of incisor winging supports affiliation with contemporary Native Americans, since, like shoveling, it is rare in Western Eurasia, Sub-Saharan African and Sahul-Pacific populations, and found in highest frequencies in Northwest Siberia and North and South American populations;

- the presence of a lateral upper incisor interruption groove supports affiliation with contemporary Native Americans, because interruption grooves also occur in lowest frequencies in Sub-Saharan African and Sahul-Pacific populations, intermediate frequencies in Western Eurasia, and highest frequencies in Native Americans;
- the absence of Carabelli's trait (an extra cusp) on the right third molar, supports affiliation with Native Americans based on data showing the extra cusp is most common in Western Eurasians groups and least common in American Indians and North Asians; and
- the presence of enamel extensions on both third molars and the left second molar supports affiliation with contemporary Native Americans, based on data showing low frequencies of enamel extensions in Eastern Europe and the highest frequencies in East and North Asia and Native American populations.

Id. at 0990-0992. Professors Goodman and Martin concluded on the basis of these observations that, “[a]lthough severe dental attrition has reduced the number of dental traits that might be studied, the results are clear to us and apparently too to Christy Turner II.” *Id.* at 0992. They note that, on his Spirit Cave Man form, Turner noted: “Impression – Sinodont.” *Id.* According to Professors Goodman and Martin, the “dental evidence *strongly suggests* that Spirit Cave Mummy is biologically related to North Asians and Native Americans. The chance of a European having all five of the traits listed above may be *close to nil.*” *Id.* (emphasis added); *see id.* at 1900-1902.

In a paper published after BLM issued its determination, Turner reports on a new analysis of the biological affiliation of the Spirit Cave and nearby Wizard's Beach remains based on Multivariate Mean Measures of Divergence. *See* AAR 1902; Exh. P (Turner). Turner's new work is the most reliable study conducted to date; it utilizes an exceptional comparative database of over 30,000 individuals and uses data (tooth crown and root variations) that are under strong genetic control. AAR 1903. The results link groups based on the degree of dental genetic

similarity or difference. *Id.* at 1902. *The Spirit Cave and Wizard's Beach remains are most closely linked to a group of more recent Native Americans from Nevada, and then eight other Native American groups*, a finding that strongly supports the Tribe's claim that the remains are affiliated with contemporary Northern Paiute. *Id.* at 1903; Exh. P at 140 (Fig. 6). As Professor Goodman concluded in a report to the NAGPRA Review Committee, the "preponderance of biological information, and the least ambiguous biological information, specifically dental discrete traits, confirms that Spirit Cave is biologically linked to the Paiute and other Native Americans from the region, and to contemporary Native Americans." AAR 1905.

BLM's analysis of dental morphology cites the Goodman and Martin report but does not mention its conclusions. BLM acknowledges dentition can provide "indications of general group identity," the use of dental morphology and dental morphological traits has a long history in dental anthropology, and innumerable studies have been conducted on teeth, particularly the frequency variation of traits regarding general group identity. AAR 2019. However, BLM asserts there are several problems inherent with the methodology: an overlap in the frequency of traits among different groups; the entire percent of frequency variation worldwide may range to less than 35%; no trait is totally absent in any group; and a single individual may possess all, some, or none of the traits that appear to define the group. *Id.* BLM also notes that, except for the third molars, the teeth of the Spirit Cave remains are severely worn, limiting the available information. *Id.*

BLM then discusses the particular traits identified by Edgar, Turner, Goodman and Martin, acknowledges Turner's "Sinodont" impression, and states the "frequency of the traits

noted in the Spirit Cave dentition, and the presence of these traits as a group, is generally higher in Asians and Native Americans.” AAR 2019-2020. However, BLM asserts, “for the reasons stated above, this does not address affiliation with a *specific* contemporary Native American group.” *Id.* at 2020 (emphasis added). After citing an abstract of a study by Powell, which found “Paleoindians are dentally and craniofacially distinct from both European . . . and modern Native American . . . populations, but not from northeast Asians . . . or Polynesians,” BLM concluded: “The suite of dental traits present or absent in the dentition of [the] Spirit Cave [remains], do not allow for the assignment of [the] Spirit Cave [remains] to an affiliation with a particular tribe, given the state of the technology and the theoretical framework at this time.” *Id.*

In its analysis, BLM does not address the frequency of the particular traits identified by Goodman and Martin, and thus provides no basis for rejecting their conclusion that the “dental evidence *strongly suggests* that Spirit Cave Mummy is biologically related to North Asians and Native Americans. The chance of a European having all five of the traits listed above may be *close to nil.*” AAR 0990 (emphasis added). Further, the Powell study involved 18 Paleo-Indian remains from North and South America and combined craniofacial and dental traits; it does not discuss the dental evidence from the Spirit Cave remains particularly or suggest any disagreement with the conclusions reached by Goodman, Martin and Turner. Exh. Q at 224 (Powell).¹¹ Finally, BLM’s conclusion that dental traits do not allow assignment of the Spirit

¹¹ It is noteworthy that Powell found heterogeneity among the Paleo-Indian group “was no greater than that obtained for samples of similar size drawn at random from comparative populations,” and that “a single wave of migration *could* be adequate to explain observed differences between Paleo-Indian founders and later descendants, depending on the timing of the colonization event.” *Id.* at 223-24. Thus, the study provides no support for BLM’s speculation

Cave remains to any particular tribe was made before, and thus does not address, Turner's most recent study, which finds the Spirit Cave dentition is most closely linked to recent Native Americans from Nevada. As we discuss below, Turner's finding was presented both to the NAGPRA Review Committee and to BLM, but there is no indication in the record that BLM ever considered it.

Biology – DNA. In its discussion of DNA evidence, BLM's determination identifies a number of studies that have been conducted in recent years involving mitochondrial DNA (mtDNA). AAR 2020-2021. BLM explains that nearly all Native Americans carry one of four mtDNA haplogroups (A, B, C, or D), which are also present in Asian and Tibetan groups. *Id.* at 2021.¹² "As these 4 haplogroups characterize most modern Native American groups, it appears to imply a limited number of founding groups from Asia which spread across North and South America," although, BLM asserts, it is possible "diverse groups entered North America but came to genetic dead ends due to disease, accident or war." *Id.*

BLM explains that DNA analysis was not undertaken on the Spirit Cave remains, for three reasons: (1) it is a destructive technique; (2) even if sufficient information could be amplified and sequenced, it is most likely it would fall into one of the four haplogroups that characterize American Indian and Asian populations; and (3) although DNA studies might rule out certain groups as related to this individual, such studies would not allow assignment of the Spirit Cave remains to affiliation with a particular tribe. AAR 2022.

about multiple founding populations or genetic discontinuity between Paleo-Indians and modern Native Americans.

¹² A new group, X, has been noted in both ancient and contemporary American Indian material as well as contemporary European and Near Eastern populations. *Id.*

Nevertheless, BLM suggests the results of recent DNA studies are relevant to the affiliation issue addressed in the determination. Scientists have examined the frequency of mtDNA haplogroups among various groups, and have found the frequency of the principal Native American haplogroups varies among tribes. See AAR 2021. BLM cites O'Rourke (1999) for the proposition that DNA studies on skeletal materials from the eastern and western Great Basin, from prehistoric sites thousands of years later than Spirit Cave, "suggest a heterogeneous group of ancient populations inhabiting the Great Basin in antiquity. Frequency differences between ancient samples for specific markers may reflect both the diachronic nature of the samples and the well-known occurrence of lineage extinctions in small populations." *Id.* And it cites a series of studies by Kaestle, whose findings, according to BLM, are "rather preliminary and limited," but "appear to indicate" that modern groups comprising Northern Uto-Aztecan speakers and Native residents of the Great Basin "are generally not related to ancient Western Nevada samples." *Id.* at 2022.

These statements do not fairly portray the conclusions reached by O'Rourke and Kaestle. In an article published in 2000, O'Rourke and others evaluated mtDNA variation in six ancient population samples of North America relative to 41 modern North American populations distributed throughout the continent. Exh. R at 16 (O'Rourke). Analysis of the modern populations confirmed substantial *geographic* structuring of mtDNA haplogroup frequencies, with the ancient samples showing haplogroup profiles that are most similar to those of modern populations inhabiting *the same geographic* areas today. *Id.* "This result indicates a surprising

stability of mtDNA haplogroup profiles over the past 2,000+ years of the Holocene in indigenous populations of the Americas.” *Id.*

One of the ancient samples in the O’Rourke study was derived from Pyramid Lake and Stillwater Marsh remains that spanned the period from 300 years BP to 6,000 years BP and, thus, reached back into the middle Holocene. *Id.* at 16-17. The modern samples included a small Paiute / Shoshone group, comprising nine individuals. *Id.* at 17. In plotting the results, O’Rourke *et al.* note the “Paiute / Shoshone of the Great Basin plot in the upper central portion of the component map, near the geographically proximal ancient Pyramid Lake and Stillwater Marsh samples.” *Id.* at 24. Two other modern groups, California Penutians and California Uto-Aztecs, also plot in this area and are geographically not too removed from the locale of the ancient samples.” *Id.* Thus, the “*ancient Pyramid Lake and Stillwater Marsh samples . . . illustrate . . . temporal and regional continuity.*” *Id.* at 27 (emphasis added).

O’Rourke *et al.* expressed some caution about linking these samples to modern populations in the region, given certain limitations on the study, including the small size of the modern Paiute / Shoshone sample. *Id.* at 27-28. However, they noted Kaestle had reached similar results, based on a larger sample of northern Uto-Aztecan speakers. *Id.* at 28. Moreover, O’Rourke *et al.* concluded that, “[g]iven the extremely long temporal range of the ancient samples from the western Great Basin, it is perhaps not surprising that they show affinity to more than 1 modern population sample but only those in the general geographic area or those in adjacent geographic areas with reasonable links to the area prehistorically.” *Id.* at 28-29. This is consistent with the overall conclusion of the study, namely, that the geographic patterns so

evident in modern Native American populations arose early (greater than 2,000 years before present) and have remained relatively stable since. *Id.* at 31-32.

These conclusions are inconsistent with the proposition that a wholesale population replacement took place in western Nevada about 1,000 years ago, and support the Tribe's claim of a shared group identity with ancient inhabitants in the western Great Basin. However, there is no mention of O'Rourke's 2000 study or its conclusions in BLM's determination. As discussed below, the Tribe presented a detailed analysis of O'Rourke's study to the NAGPRA Review Committee, AAR 1755-1756, as well as a summary prepared by Professor O'Rourke, *id.* at 1915-1918, and these materials were subsequently provided to BLM. However, there is no indication in the record that BLM *ever* gave any consideration to them.

BLM's characterization of Kaestle's studies also omits findings supporting the Tribe's position. Kaestle's initial study concluded "the Stillwater Marsh skeletal population might be ancestral to the Northern Uto-Aztecan speaking people (or the Great Basin geographic group)" because they both had similar frequencies of haplogroup B. *See* AAR 1757. This result "provide[d] no evidence of a population replacement." *Id.*

In her next study, which was discussed in O'Rourke (2000), Kaestle included remains from the Pyramid Lake region as well as the Stillwater Marsh skeletal remains in an "ancient Western Nevada group." *Id.* Although the results suggested a modern California Penutian language group and a modern California geographic group were plausible descendants of the ancient Pyramid Lake group, they also suggested "the ancient Western Nevada group, while closest to the California groups, *might also be related to the Northern Uto-Aztecan language*

group and/or the Great Basin geographic group” Id. (emphasis added). Kaestle suggested an “admixture” between ancient groups occupying the western and central Great Basins “could have produced the frequency distribution seen in the modern Numic inhabitants,” a hypothesis she believed was supported by studies of the frequencies of an albumin variant, albumin Mexico, in these groups. *Id.* at 1758.

In a third study, Kaestle’s results implied “that the modern Washo and Northern Uto-Aztecan and the ancient Pyramid Lake groups are all subdivision of one population, or that any differences among them are quite minor.” AAR 1758. She believed these results were, nevertheless, consistent with a recent expansion of Northern Uto-Aztecan into the Great Basin “accompanied by a limited admixture with the previous inhabitants.” *Id.* Under this scenario, the ancestors of the modern Uto-Aztecan speaking peoples would include “females from the ancient Western Nevada populations.” *Id.*

Although it cites Kaestle’s studies, BLM does not present any of the results supporting a biological link between modern Native inhabitants of western Nevada and ancient Nevada populations.

Biology – Serum Albumin. BLM states that albumin, a noncollagenous protein, is one of several serum proteins with rare forms that are specific to particular ethnic groups, language stocks, or language families in the New World.” AAR 2022. In general it is less studied than mtDNA, and the Spirit Cave remains have not been subjected to albumin analysis. *Id.* at 2022-2023.

Nevertheless, BLM presents the results of a study by Kaestle and others, in which she examined frequencies of two albumin variants, Naskapi (Al^{Na}) and Mexico (Al^{Me}), as well as the mtDNA haplogroups, in Stillwater Marsh remains and various modern groups. AAR 2022-2023; Exh. S at 169 (Kaestle). According to BLM, Kaestle found “frequencies of Al^{Me} and haplogroup D are very high and both Al^{Na} and haplogroup C are absent” in the Stillwater Marsh remains AAR 2022. BLM then quotes the following conclusion: “Unless sampling error or stochastic evolutionary changes have profoundly influenced the results of this study, the Zuni, Washo, and all Northern (but not Central) Uto-Aztecan language groups, including Numic, and the Great Basin geographic group can also be eliminated from consideration as probable descendants.” *Id.* at 2023.

However, in analyzing the results, Kaestle and her colleagues actually presented “four alternative conclusions.” Exh. S at 180. The first is that “the Stillwater skeletal population might be ancestral to the historic Numic-speaking people of the western Great Basin.” *Id.* The authors regarded this as the “least likely of the four hypotheses,” *id.*, but did not believe, on the basis of existing evidence, that any of the hypotheses “can be discounted.” *Id.* at 182. They also suggested, as Kaestle had previously, that modern Numic people might be the descendants of pre-Numic and Uto-Aztecan (proto-Numic) people, since “admixture between Numic males and females and pre-Numic females might have produced the pattern seen today among modern Numic peoples.” *Id.* at 181-182. BLM’s failure to present either of these conclusions renders its description of the study highly misleading.

Biology – Hair. BLM states hair has long been used to describe group affiliation differences. AAR 2023. It notes that macroscopic appearance was the elementary method of study until the early 1980s, but the approach now involves microscopic techniques as well. *Id.* It explains that “[g]roup affiliation, in the broadest of terms, White, Black, Mongoloid, can often be assigned to an individual using the microscopic study of head hair.” *Id.* (This observation illustrates just how broad the term “group” can be, but, as noted above, BLM does not consider the meaning of the term “group” in NAGPRA.)

BLM presents the results of one analyst, Craig Lahren of the Hamilton County Medical Examiner’s Office, who concluded that the hair from the Spirit Cave remains was “consistent with hair derived from the . . . scalp of a Caucasian individual.” AAR 2023. It also notes, however, that an FBI analyst, Joseph DeZinno, found “dark reddish-brown *Asian* origin head hairs,” and Goodman and Martin concluded the hair was “exactly the color and form [that] is most common in [a] Northern Asian or a Native American.” *Id.* (emphasis added).¹³ The biological paper that accompanied the determination (but not the determination itself) notes another FBI analyst, Douglas Deedrick, analyzed two hair samples from the Spirit Cave remains, one provided by BLM and the other the sample analyzed by Lahren. *Id.* at 2107. Deedrick found “all of the hairs submitted exhibit microscopic characteristics consistent with originating from an individual of *Asian (Mongoloid) ancestry.*” *Id.* at 2107 (emphasis added).

¹³ The determination does not mention the Wheelers’ report that, when first exposed, the hair was straight and black. *See id.* at 1900; Exh. B at 16 (Wheeler).

BLM concludes the hair studies “do not allow assignment of [the] Spirit Cave [remains] to an affiliation with a particular tribe,” but does not present any conclusion as to whether they support a finding that the remains are Native American. AAR 2024.

Biology – Lifestyle and Environment Indicators. In its discussion of Spirit Cave dentition, BLM notes that Edgar, Goodman, Martin, and Turner all noted the presence of possible “string” grooves on the incisal surface of 6 teeth. AAR 2020. BLM acknowledges that string grooves have been noted in other Great Basin material, and that Larsen, in a study of prehistoric Great Basin material, felt the grooving of anterior teeth was the result of sinew and plant fiber preparation using teeth to produce string or lines. *Id* at 2020, 2102-2103. However, BLM apparently dismisses the significance of this common production technique in the Great Basin by stating the use of teeth as tools is a rather common practice among peoples living in traditional societies throughout the world. *Id*

BLM does not discuss any other biological evidence regarding the lifestyle or environment of the individual buried in Spirit Cave. Goodman and Martin carefully analyzed and described the biological characteristics of the remains utilizing the Standards for Data Collection from Human Skeletal Remains (1994), a set of procedures and methods for collection of data from human remains that has been used in NAGPRA compliance projects. AAR 09984-0986. They found the occupational markers on the skeleton are most consistent with activities related to walking / jogging over rough terrain for long periods, fishing, hunting, and other subsistence activities that required squatting, lifting, and carrying heavy loads. *Id.* at 0985, 1899. The remains contained severe bone spurs in the feet, which are particularly suggestive of

someone who traveled great distances on foot. *Id.* Thus, the lifestyle-related biological indicators are consistent with adaptation to the Great Basin region and the use of the marshes and caves over large distances, and, in particular, are consistent with “the oral narratives provided by the tribe and Fowler (1992) that document ancestral lifeways of the indigenous people living in the Great Basin.” *Id.*

Scientists who examined the remains for the Nevada State Museum reached similar conclusions. For example, Napton’s preliminary visual examination of coprolitic material from the Spirit Cave remains indicates the individual’s diet included at least two kinds of fish, one of which was probably Lahontan chub, and bulrush seeds. Exh. T at 100 (Napton). Napton found this to be consistent with an adaptation to a marsh environment. *Id.*

Similarly, Eiselt’s analyses of fish bones and pollen from the remains’ fecal material suggest a marsh adaptation, one which appears to be an early proto-type of the Cattail-eater adaptation in ethnographic times. The fish bones include tui-chub, speckled dace or Lahontan reidsides, and suckers, indicating that the water regime surrounding Spirit Cave included some moderately swift and some benthic water habitats. Exh. U at 132 (Eiselt). Indeed, Eiselt suggests a modern photograph of Carson Lake may be a fair representation of the water habitat surrounding Spirit Cave 9,400 years ago. *Id.* at 127, Figure 5. The small size of the fish captured by the individual buried in Spirit Cave also implies they were taken in a shallow water system, “possibly with basketry or very fine net-mesh dip techniques.” *Id.* at 132. Thus, on the basis of the fish remains in the fecal material, Eiselt argues that the people who used Spirit Cave 9,400 years ago exploited a marshland or meandering stream environment, and mass captured

fish for consumption. *Id.* at 133-34.

Pollen analysis provides further support for this conclusion. "In general, the airfall background pollen and fish remains in the fecal boluses from the Spirit Cave individual evidence the presence of both nearby marsh (cattail [*Typhia*] and sedge [Cyperaceae pollen], and desert shrub (comprising both shadscale [chenoams] and greasewood (*Sarcobatus*)) communities." Exh. V at (Wigand). It is therefore clear that, "as in late Archaic times, although desert shrub communities were well established, marshes were present and resources harvested from them were an important component of the diet." *Id.* at 115.

This evidence of the environment, lifestyle, and adaptation of the people responsible for the Spirit Cave burial is not addressed in BLM's determination. As discussed above, it led Touhy and Dansie to describe these people as "lacustrine based Hunter-Gatherers of the Early Holocene Age," people who "were pioneers on new land 9,400 year ago, subsisting on the same basic food stuffs as their successors," people who displayed "many similarities to the Lovelock Culture 5,000 years later," and people who exhibited a "desert marsh tradition" that may have persisted for thousands of years. *See* AAR 1734. Nevertheless, this evidence is not presented with the biological evidence or elsewhere in the determination, and its bearing on the question whether the Spirit Cave remains were part of an identifiable earlier group or whether there is a relationship of shared group identity between that group and the Fallon Tribe is not addressed.

Geography. In this section of the determination, BLM acknowledges the ICC's findings that the Northern Paiute, include the Fallon Tribe, are a "clearly defined group of American Indians" within the meaning of the ICCA, that an area in Nevada "had been exclusively occupied

and used in the Indian fashion *from time immemorial* by bands or groups of Northern Paiute Indians,” and that this area includes Spirit Cave. AAR 2025 (emphasis added). BLM minimizes the significance of this finding by asserting that the phrase “from time immemorial” is merely a “term of art” and does not represent an evidentiary determination of how long the Northern Paiute lived in the region. *Id.* BLM adds that NAGPRA only requires ICC findings to be considered along with other lines of evidence when determining affiliation for remains discovered before its passage, and concludes the geographic evidence “does not, and cannot, demonstrate the existence of either an earlier group or of a shared group identity between any present-day Indian tribe and any earlier group.” *Id.* at 2025-2026.

BLM does not explain why this is so. If the diverse “Indians of California” are an identifiable group of American Indians, *see Thompson v. United States, supra*, it is not at all clear why the prehistoric occupants of the western Great Basin, or the prehistoric occupants of aboriginal Northern Paiute lands, are not likewise an identifiable group. Put another way, BLM never considers whether geography itself is an identifying factor under NAGPRA. When the other evidence linking these people – such as a similar hunter-gatherer lifestyle, an evolving desert marsh adaptation that is unique to the Great Basin, the central importance of textiles and continuity in certain textile forms, a common burial pattern, biological links established through dental, DNA and skeletal evidence, and the fact that they have been identified and studied by scholars as a group – is considered along with geography, there is substantial evidence in support of the proposition that they are an identifiable earlier group with which the modern Northern Paiute, and the Fallon Tribe in particular, have a relationship of shared group identity. Because

it never confronts the meaning of the term "group" in NAGPRA, BLM never considers the evidence in this manner.

Moreover, BLM does not mention – here or anywhere else in its determination – the Tribe's deeply held belief that it is the "caretaker" for all the "old ones" in its aboriginal domain, AAR 0178, a belief which creates, in the Tribe's view, a strong relationship of shared group identity. NAGPRA makes tribal traditions and beliefs relevant to the affiliation analysis, *see, e.g.*, 25 U.S.C. § 3005(a)(4), but, at least in this case, the BLM determination does not even mention them.

Linguistics. BLM's discussion of linguistic evidence begins by acknowledging the "only direct descriptive linguistic data . . . available shows that Numic speaking Northern Paiute bands occupied the Spirit Cave area at first contact." AAR 2026. However, BLM states this does not indicate how long the ancestors of those Northern Paiute bands occupied the area, or whether other groups lived there before them. *Id.* It goes on to note that since 1958 linguists have attempted to explain "the spatial distribution of linguistic groups observed in the Great Basin at contact . . . through various arguments related to what is know as the Numic Expansion model." *Id.* BLM then summarizes the following linguistic arguments that have been made in support of this model:

-- Lamb (1964) and Fowler and Fowler (1971) argued Numic-speaking people migrated out of the Mojave desert recently,

-- Sapir (1961) and others argued limited linguistic diversity of Numic in the Great Basin implies recent occupation, with Lamb arguing “glottochronology” suggests the occupation occurred no less than ten and probably no more than 30 centuries ago;

-- Miller (1986) argued for a Numic expansion from the southern desert because the closest Numic languages to those in the Great Basin are Hopi in Arizona, Tubatulabal in the Central Valley of California, and Takic in areas of southern California, while Jorgensen (1994) argued Numic-speaking people spread out across the Intermountain West around 2,000 years ago; and

-- based on her analysis of terms for the maize cultivation complex, Hill (2000) sees the Proto-Uto-Aztecan speech community as being in Mesoamerica between 5,600 years BP and 4,500 years BP, with a northern branch spreading to California, the Southwest, and the Great Basin around 3,500 years BP. *Id.* at 2027.

BLM adds that, in “opposition to the majority linguists who support the Numic Expansion model Goss (1977; 1999) argues that the linguistic evidence does not indicate an expansion within the last 1000 years and there is no linguistic reason to assume that the historic Numic speakers have not occupied the Spirit Cave area since the early Holocene.” *Id.* Similarly, “Aikens (1998:2-5) argues for great adaptive diversity, cultural continuity, and time depth among Uto-Aztecan peoples through out Western North American and Central America.” *Id.* at 2027-2028.

BLM makes no attempt to evaluate these competing arguments, and simply concludes “the unresolved controversy over the chronological issues associated with the Numic expansion

model” makes the linguistic evidence inconclusive for determining affiliation. *Id.* at 2028. However, BLM asserts the available linguistic evidence, coupled with the available archaeological and biological evidence, “suggest these lines of evidence do not support the argument for affiliation.” *Id.*

Because BLM makes no attempt to actually evaluate the linguistic arguments, its analysis overlooks important evidence. First, seventy-five years ago Kroeber noted the four northern language families of the Ute-Aztecan stock “appear as if raying in a semicircular fan from a point in south-central California, on or near Kern River.” AAR 1785; *see id.* at 2055. However, Kroeber found it “highly improbable that they actually spread out thus,” and argued the focus in south-central California was “the region where condensation has been the greatest, the tract where newcomers gradually agglomerated, not the hive from which the whole body swarmed.” *Id.* Instead, noting the languages “east of the Sierra are scarcely distinguishable from their congeners throughout the Great Basin,” Kroeber contended:

It is entirely conceivable that these tongues have been spoken in their present locations *from time immemorial*. Their territory is the Great Basin; their speakers were actually part of the Plateau tribes; and there is no foreign element or anything else to indicate that they had any antecessors on the spot.

Id. (emphasis added). BLM does not mention Kroeber’s work in its determination.

Second, the vast majority of linguists have rejected the linguistic theory, “glottochronology,” on which the Lamb hypothesis rested. AAR 1785. In a report prepared for the Tribe and in an earlier article, Grayson traced the origins of glottochronology, which rested on the assumption that terms within a core vocabulary are lost at a constant rate – the linguistic equivalent of a constant rate of decay. *Id.* Grayson showed that repeated efforts to test

glottochronology produced “horrendous results” that were “illusory and unreliable,” “full of inconsistencies,” and “absurd.” *Id.* at 1786. These studies “disproved the basic assumption of glottochronology,” demonstrating the constant rate assumption was “false.” *Id.* Under these circumstances, Grayson concluded the Lamb model provides “no justification for any argument that Numic speakers have not been in their ancestral homelands since the Great Basin was first occupied, sometime prior to 11,000 years ago.” In presenting Lamb’s model, BLM does not mention Grayson’s critique and makes no attempt to respond to it.

Third, in its submissions to BLM, the Tribe showed that archaeologists have developed standard criteria to determine whether prehistoric migrations occurred, but that no one has ever attempted to show the Numic expansion model can satisfy these criteria. AAR 1787, 2358-2361. In presenting Lamb’s model, BLM does not mention these criteria or attempt to apply them.

Fourth, BLM does not address the inconsistencies between the various Numic expansion theories, or between those theories and the archaeological record. In the theories BLM summarizes, the expansion took place recently, 1,000 to 3,000 years ago, 2,000 years ago, or 3,500 years ago, and originated either in the Mojave desert, the “southern desert” or Mesoamerica. BLM makes no attempt to reconcile these theories with compelling evidence of continuity in the northern and central Great Basin over much greater time periods. As discussed above, there is a “remarkable degree of continuity” in basketry forms and structures in the northern Great Basin, which spans the Holocene and continues in the historic period, AAR 1741, and Thomas has documented that the ethnographic system described by Steward has operated in the central Great Basin for at least 4,500 years. *Id.* at 1707, 1744. Both of these findings

contradict a Numic expansion that originated in the south within the past 3,500 years, but BLM makes no mention of them.

Fifth, BLM gives no consideration to the "admixture" hypothesis advanced by Kaestle on the basis of her DNA and serum albumin studies. For BLM, either Numic speaking people expanded into the Great Basin displacing everyone who had been there before them, or they were the only people ever present in the Great Basin. In this "billiard ball" model human groups are discrete and separate; when one is in motion and comes in contact with another, either the one in motion moves on, leaving the other relatively unchanged, or it replaces the hit ball, which moves away. See AAR 1903-1904. This model is almost certainly a distortion of reality; it is far more likely that, if Numic-speaking did expand into the Great Basin at some time in the past, they interacted with the previous occupants such that their descendants can trace their genetic and cultural heritage back to both groups. *Id.* at 1905. This more complex model is consistent with all of the archaeological, biological, and linguistic evidence, *id.*, yet BLM never considers it.

Sixth, BLM gives extremely short shrift to Goss and Aikens. Goss and Aikens both looked at the distribution of *all* Uto-Aztecan languages, rather than just at the distribution of Numic languages on which Lamb relied. Goss explains that historical linguists generally agree that the Uto-Aztecan stock can be classified into eight roughly coordinate families, with Numic found farthest to the north and Aztecan found farthest to the south. AAR 01752. According to Goss, the "general inference, from the distribution of these families, is that these languages represent the result of gradual divergences of the Uto-Aztecan block of languages in the Intermountain, Southwest and northern Mexican areas," while the 'center of gravity' or inferred

homeland of the ancestral Utaztekan community logically lies in the Intermountain West.” *Id.*

Nearly 30 years ago, long before the Spirit Cave remains were dated, Goss wrote:

Numic speakers are in the Great Basin. Except for a small island of Hokan Washo, they are the only peoples in the Great Basin. This is the only positive evidence. There is no other evidence to argue from. *The most parsimonious model is that Numic speakers and Washos, and their ancestors, have been in the Great Basin for the past 10,000 years.* We can assume a great enough antiquity of man in western North America to contain this. It is quite probable that the Intermontane and Southwest areas have contained ancestral Hokan, Keresan, Penutian, and Aztec-Tanoan speaking communities for the past 10,000 years. *Working only from positive evidence, there is no ground for bringing any of these groups in from outside; they are there.*

Id. (emphasis added).

Similarly, Aikens worked from the known distribution of at least 21 language families that comprise the Uto-Aztecan phylum. AAR 1753. These languages overspread the interior west from the Aztec realm in central Mexico to Ute territory in Utah and Colorado, and beyond to the Shoshone and Comanche ranges in the Rocky Mountains and the High Plains. *Id.* Since all of these languages arose from one ancestral speech community, “it is clear that their observable diversity implies *a deep history of related groups spreading out*, settling into home ranges, and over time evolving progressively different speech habits from their sister communities.” *Id.* (emphasis added).

That this process involved “a gradual growing apart of speech communities,” rather than a more recent expansion or migration, is suggested by the fact that Uto-Aztecan languages are geographically adjacent to their linguistically closest relatives, while the greatest dissimilarities occur between Numic on the north and Aztec on the south. AAR 1753. Furthermore, Aikens concludes this process places ancestral Uto-Aztecan in the Great Basin for over 11,000 years.

Id. He notes that linguists have suggested Uto-Aztecan evolved from an extremely remote Aztec-Tanoan speck community, which in turn evolved from an ancient Macro-Penutian superphylum, taking “the ancestral speech communities of the modern Uto-Aztecan two steps further back into deep time.” *Id.*¹⁴ Moreover, this interpretation provides the best fit with the positive linguistic and archaeological evidence, and thus “is the most parsimonious hypothesis by which to link archaeological and linguistic prehistory in the desert west, and no factual evidence suggests a better idea.” *Id.* at 1753-1754. As discussed above, Aikens points specifically to human occupation of the far west at least 11,000 years ago, “when we see the beginnings of a desert culture like that carried by Uto-Aztecan peoples down to the present day.” *Id.* at 1754. Noting the Northern Paiute, Shoshone and Southern Paiute members of the Numic family “are well-described as highly mobile hunter-gatherers following annual harvesting cycles that carried them across hundreds of miles of altitudinally and biotically varied country in the course of a year,” Aikens explains the “subsistence economics of this lifeway entailed that these Northern Uto-Aztecan routinely gathered, transported, and stored plant foods, *relying on species, and on milling and other technology, that can be followed back some 10,000 years in the archaeological record of the Great Basin desert culture.*” *Id.* at 1754-1755 (emphasis added).

In its brief reference to Goss and Aikens BLM does not present the substance of these arguments and does not respond to them.

¹⁴ These linguistic relationships are consistent with O'Rourke's and Kaestle's studies, which found a biological connection between ancient Nevada remains and a modern California Penutian group as well as Numic-speaking people. *See* AAR 1757-1758. BLM does not address either the linguistic or biological evidence on this point.

Anthropology. BLM's discussion of anthropological evidence addresses ethnographic burial practices and "folklore/oral tradition." AAR 2028-2038. It contains no discussion of the following:

-- The Great Basin Culture Area. As noted above, anthropologists groups sets of peoples into "culture areas" based on similarities in such things as the nature of their subsistence pursuits, their sociopolitical organization, their material manufactures, and their religion. AAR 1703. The Great Basin Culture Area is a spatial grouping of peoples who, at the time of European contact, were far more similar to one another than they were to peoples in adjacent culture areas. *Id.* at 1703, 1709. The classical ethnographic picture of Native American lifeways in the Great Basin was drawn by Julian Steward. *Id.* at 1705. His description of these lifeways fits well with the prehistoric Desert Culture concept articulated by Jennings, as well as the archaeological record, *see* AAR 1707-1708, but BLM does not discuss it or its implications for the existence of a relationship of shared group identity among the ethnographic and prehistoric peoples of the region.

-- Northern Paiute and *Toidikadi* Ethnography. There is a rich ethnographic literature on the Northern Paiute generally and the *Toidikadi* particularly, which encompasses far more than burial practices and folklore. *See* AAR 1708-1731. As a group, the Northern Paiute controlled a large territory within the Great Basin, from near the Columbia River on the north to and through what is now western Nevada to east-central California. *Id.* at 1708-1709. Within this territory, the *Toidikadi* held as their home district a large area surrounding the Carson Desert. *Id.* at 1709-1712. Spirit Cave lies in the center of their domain: to the north, south, east,

and west are the camp sites where the *Toidikadi* lived; the key resources areas where they hunted, fished and gathered; the sites where they assembled for festivals and other communal events; and the sacred sites that recalled events long ago and the people's continuing ties to the region. *Id.* *Toidikadi* subsistence and material culture bear many features that are found in the archaeological record of the region, including the archaeology of Spirit Cave. *See id.* at 1712-1731. Among other things, they utilized the resources of the marshes and surrounding desert, as did the individual buried in Spirit Cave, *id.* at 1712, 1733-1734; made duck decoys bearing striking similarity to those found in "Lovelock" assemblages, *id.* at 1713, 1728, 1747; consumed fish such as tui chub, Tahoe sucker, redbreast shiner and speckled dace, all of which were consumed by the individual buried in Spirit Cave, *id.* at 1714, 1734; made houses and other structures that resemble those in the archaeological record, *id.* at 1721-1724, 1744-1745; used metates and manos – which became common in the middle Holocene and remained so throughout the rest of prehistory – as seed processing equipment, *id.* at 1726, 1742; manufactured 2-ply, S-spun, Z-twist cordage – the same cordage used in the Spirit Cave assemblage – and used it for netting, fish line, trap string and other items, *id.* at 1726, 1732-1733; manufactured nets for tui chub and other small fish, much as has been hypothesized for people responsible for the Spirit Cave burials, *id.* at 1727, 1734; made twisted rabbit fur robes similar to the robe in which the Spirit Cave remains were wrapped, *id.* at 1727, 1733; participated in the very ancient tradition involving the extensive use of tule technology, which goes back several thousand years in marshy environments of Western Nevada, *id.* at 1727; in their use of basketry were "linked tightly with other Great Basin peoples in the recent as well as the distant past, for

basketry has been a major hallmark of cultures in the region for at least 10,000 years,” *id.* at 1729; and used both twining and coiling techniques as methods of basket manufacture (although twining was by far the most common), both of which are found in the archeological record, *id.* at 1741-1742. BLM addresses none of this in its determination.

-- Origin Stories. Two of the reports the Tribe submitted to BLM addressed Uto-Aztecan origin stories. AAR 1036-1055, 1759-1760, 2756-2758. In *Toidikadi* stories, children were dispersed to start human populations from Fox Peak in the Stillwater Mountains. *Id.* at 1036. According to Goss, this is consistent with the origin stories of all Uto-Aztecan in the Intermountain West, who have their origin stories in their homeland, with no traditions of migrations from other places or conquering unrelated peoples. *Id.* at 1037. Notably, the Aztecs in Mexico “have traditions that their ancestors came from an ancient homeland of lakes to the north, in what is now the western United States.” *Id.* Goss believes the uniform Uto-Aztecan belief in a homeland in a “Place of Lakes” in the Intermountain West should be considered a cultural memory reflecting the Uto-Aztecan’s early adaptation to the post-Pleistocene lacustrine environments of the Intermountain West. *Id.* Walker likewise found that Uto-Aztecan origin myths “include no references to population replacement theories in which contemporary Ute-Aztecan peoples are alleged to have replaced previous human populations in the Great Basin.” *Id.* at 2756-2757; *see id.* at 1882-1883. Instead, their stories, which trace the people’s ancient beginning to a time when there were great lakes and bodies of water in the Great Basin, seem only to show that Uto-Aztecan people were created “in their present homeland.” *Id.* at 1759-

1760, 1883. Although these stories are relevant under NAGPRA, 25 U.S.C. § 3005(a)(4), BLM makes no mention of them.

Instead of addressing these matters, BLM, in the longest single section in its determination, focuses on “historical legends” concerning the Sai’dukai. AAR 2030-2038. BLM states most such legends refer to early post-contact time, about 1830. *Id.* at 2030. It concludes from its review of the Sai’dukai legends “that there were at least two groups in the area and this means that this line of evidence does not support the argument for affiliation.” *Id.* at 2038.

As a threshold matter, this conclusion disregards fundamental anthropological knowledge about the Northern Paiute. As Professor Walker explains:

Everything we have learned from more than a century of anthropological research points to numerous, highly localized Numic groups in the Great Basin. These localized groups usually consisted of several different bands that would come together during parts of the year, dispersing afterwards during their seasonal rounds. However, *all of these bands in the Spirit Cave area would be considered Northern Paiute today.*

AAR 1881-1882 (emphasis added). As noted above, the ICC expressly found that *all* of the Northern Paiute bands comprised an “identifiable group of American Indians.” *Id.* at 1699. Thus, the presence of multiple “groups” in the area does nothing to undermine argument for affiliation of the Tribe with other Northern Paiute groups or with the prehistoric occupants of the region.

Indeed, in the next section of its determination BLM states “the available historic record shows that the ancestors of contemporary Northern Paiute bands occupied the Spirit Cave area at first contact on or before 1818. AAR 2039. It specifically reports that in May 1829 Peter Skeene

Ogden and his party “encountered Indians at Lovelock, Nevada (the Humboldt Sink) who were clearly the ancestors of the modern Northern Paiute.” *Id.* at 2038. Although this is the very time and place where the Sai’dukai legends place the Sai’duka group, BLM makes no attempt to reconcile its reading of the legends with the historical record.

BLM acknowledges “numerous discrepancies” in the Sai’dukai legends, but identifies certain elements it believes were retained throughout two significant versions of them. AAR 2036. In the first version, the Sai’dukai were Numic speakers who lived at Humboldt Lake and were defeated by the Paiute, and in the second version they came from another area and after being defeated in battle departed. *Id.* at 2036-2037. Notably, *neither* of these versions involves a non-Numic speaking people who were present in the area before, and were displaced by, Numic-speaking peoples. Under these circumstances, BLM does not explain how the legends undermine the Tribe’s claim of affiliation. *See also* AAR 1783-1784, 1880-1884 (discussing these and other problems with BLM’s reliance on the Sai’dukai legends).¹⁵

Historic. Historic evidence confirmed that the ancestors of contemporary Northern Paiute bands occupied the Spirit Cave area at first contact in 1818 or before. AAR 2039. BLM found this evidence relevant, but lacking “sufficient time depth to be conclusive for determining affiliation.” *Id.*

¹⁵ In its discussion of the Sai’dukai legends, BLM relies on Bath, who “suggests the archaeological evidence is strong for a continuous cultural sequence dating to at least 4,000 years in the caves surrounding the Humboldt Sink.” AAR 2037. Bath’s suggestion is consistent with Grosscup’s analysis, and at odds with BLM’s suggestion that the Lovelock culture was unrelated to the Northern Paiute. However, BLM does not mention Bath’s suggestion in its discussion of the archeological evidence.

Expert Testimony. The determination acknowledges contemporary tribal elders assert the Northern Paiute have been in the Spirit Cave area from “time immemorial,” but asserts this testimony “does not provide sufficient detail to trace this asserted relationship historically or prehistorically from the present back to the early Holocene.” AAR 2039. BLM also claims other relevant expert testimony is summarized in the determination and its associated references, and that any “[a]dditional expert testimony would vary across the spectrum of opinions already presented and would not contribute additional new evidence applicable to this decision.” *Id.* This rather remarkable assertion – that there *can be no new evidence* applicable to the decision – is both illogical and inconsistent with the extensive information discussed above that is not considered in the determination.

3. BLM’s Summary and Conclusion.

The next section of the determination summarizes the evidence but presents no new evidence or analysis. AAR 2039-2043. BLM concludes with its determination that the Spirit Cave remains are culturally unidentified. *Id.* at 2044.

4. BLM’s Final Determination.

As noted above, in transmitting its determination to the Tribe, BLM acknowledged that, under NAGPRA, a tribe “may make a claim regarding human remains and associated funerary objects which are determined unaffiliated,” but stated that, if the Tribe wished to make such a claim, it should “respond by October 2, 2000 with a written statement of any new evidence supporting [its] position.” AAR 2153. On September 21, 2000, after an initial review of the determination and consultation with experts, the Tribe requested that BLM extend this deadline