

## **The structure of dialect diversity in Mono: Evidence from the Sydney M. Lamb Papers**

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### **Abstract**

The Uto-Aztecan language Mono is represented in published works by just a couple of varieties, yet dialect variation within the language is remarkably well documented in the field notes of Sydney M. Lamb. This chapter catalogs the regional variation in phonology, morphology, and lexical items within Mono represented in the *Sydney M. Lamb Papers on California Indian Languages* and uses information from these records to examine Mono dialect diversity. The analysis centers on two goals: 1) investigating spatial patterns in Mono speech and evaluating prior dialect grouping proposals, and 2) examining the mechanisms responsible for these patterns of variation. Prior small-scale dialect groupings are most identifiable in this dataset west of the Sierra Nevada, while eastern areas show more gradient differences. Innovative features contribute to the identification of at least Northwestern Mono, but layers of diffusion appear to dominate the overall formation of dialect diversity.

### **Keywords**

Mono, Uto-Aztecan, language diversification, dialectology, language contact

### **Biographical paragraphs**

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## The structure of dialect diversity in Mono: Evidence from the Sydney M. Lamb Papers

For many California languages, existing documentation is too often restricted to just a single dialect, despite the variation that is known to exist within them. Mono, one of two languages in the Western Numic branch of Uto-Aztecan, is an exception to this rule. While most published work focuses on just a couple individual varieties — North Fork on the western slopes of the Sierra Nevada (Lamb 1957, n.d., Bethel et al. 1993) and Big Pine in Owens Valley (Norris 1986) — significant documentation of the wider dialectal picture does exist.

As a graduate student at the University of California, Berkeley, Sydney Lamb worked with speakers across numerous communities, though his dissertation ultimately focused on just the North Fork variety. While Lamb made a handful of recordings, the primary product of his fieldwork were 24 notebooks, held as the *Sydney M. Lamb Papers on California Indian Languages* at the Survey of California and Other Indian Languages (Kinsman & Lamb 1953–1955a). In this paper, we report the first comprehensive cataloguing of the Mono materials in the Sydney M. Lamb Papers, as well as the first analysis of dialect variation within the language based on these materials.

In his dissertation, Lamb (1957: 14–15) mentions, though he does not demonstrate, a complex dialect situation within the language. He identifies ‘three super-dialects, comprising seven dialects, five of which can be further divided into subdialects,’ as shown in figure 1. Beyond these groupings, he identifies ‘great similarity’ between the San Joaquin River and Northern Owens Valley dialects, as well as between the Southern Owens Valley and Deep Springs/Fish Lake Valleys dialects. Lamb’s classification has never been verified, and subsequent research on the language has assumed a much simpler dialectological picture. Norris (1986) identifies only two dialects (eastern and western), and Nichols (1974) further distinguishes a single other dialect grouping.

<Figure 1 here>

**Figure 1.** Mono dialects according to Lamb (1957: 14–15)

Here we systematically examine the data in Lamb’s fieldnotes from 37 geographically dispersed speakers to develop a more comprehensive understanding of variation that has been documented within Mono. Using phonological, morphological, and lexical data from these materials we are able to examine the extent to which each of Lamb’s subdialects, intermediate groupings, and ‘super-dialects’ are supported by empirical evidence. We further investigate the contributions of sound changes, lexical innovation and borrowing, and dialect diffusion to these patterns. Ultimately, we find additional patterns of variation that cross-cut both the traditional two-way distinction and Lamb’s more detailed grouping. This suggests that dialect diversity within this language may be even more complex than previously thought.

### 1. The Mono language

Mono is spoken across the entire length of the Owens Valley in eastern California (where it is sometimes called Owens Valley Paiute), from Owens Lake in the south to Benton in the north; in the adjacent Long and Round Valleys to the northwest; to the east across the White Mountains in Deep Springs and Fish Lake Valleys; and to the west across the Sierra Nevada in the headwaters of the San Joaquin, Kings, and Kaweah Rivers (see figure 2). Northern Paiute, the other Western

Numic language, is spoken to the north, from Mono Lake into western Nevada, southeastern Oregon, and southwestern Idaho. To the east and south, Central Numic languages are spoken, with Shoshoni speakers historically living in Fish Lake Valley and Timbisha speakers around Owens Lake (Steward 1933: 236).

<Figure 2 here>

**Figure 2.** Mono-speaking areas (modified from Babel et al. 2013: 452)

Kroeber (1925:585) was perhaps the first to divide Mono into dialect areas, proposing two groups divided by the Sierra crest. As he mused, contact between these two geographic regions might well be impeded, ‘with one of earth’s greatest walls between.’ While he mentions, in passing, the existence of linguistic differences to either side of the Sierra Nevada, he emphasizes the cultural differences associated with this geographic barrier. Subsequent ethnographic work took a classification of Mono into ‘Western’ and ‘Eastern’ dialects more or less for granted (Gifford 1932, Steward 1933, 1938, Gayton 1945, 1948), as has later work by linguists. Norris (1986) and Bethel et al. (1993) characterize Mono dialect variation in binary terms, as Nichols (1974) does, though he adds a ‘northeastern dialect.’ The physical environment plays a central role in this classification, but a binary characterization of Mono dialect geography may oversimplify both the linguistic diversity of Mono and the ecological factors that encourage or inhibit diversification and convergence.

### 1.1. The Sydney M. Lamb Papers

Sydney Lamb, a student of Mary Haas at UC Berkeley in the 1950s, took on Mono for his dissertation project. As his field notebooks record, he spent the summers of 1953 and 1954 travelling between communities on both sides of the Sierra Nevada, working with speakers as he met them. For some, he met with them only a single time, while he worked more intensely with others. Lamb developed a lasting relationship with the North Fork community, in particular with Lucy Kinsman; at least a dozen notebooks are dedicated to meetings with her and include many texts and extensive elicitation sessions. Lamb’s fieldwork culminated in his dissertation, a structuralist grammar of the North Fork dialect (Lamb 1957), which was accompanied by an unpublished dictionary (Lamb, n.d.).

The field notebooks were archived at the Survey of California and Other Indian Languages, and today are all available online (see figure 3). There are a total of 24 notebooks, labeled with a letter starting at A and ending with X, containing data not just from Mono, but also from other Numic languages (Kawaiisu, Northern Paiute, Shoshoni, and Timbisha), Tubatalabal, Miwok, Yokuts, and Salinan. The notebooks containing Mono data are listed in table 1, along with the individuals whose speech was recorded in each notebook. For many speakers, all Lamb recorded was word lists (most often, numbers, body parts, and animals) or simple paradigms (e.g., possessive pronouns, verbal aspects). For the speakers he worked most intensely with, he also elicited in a number of grammatical domains, along with recording numerous texts and songs.

<Figure 3 here>

**Figure 3.** Page 1 from Notebook A, recording a meeting with Annie Wenz, in the Sydney M. Lamb Papers (Kinsman and Lamb 1953–1955b)

Lamb made audio recordings with a small number of speakers, which are also archived at the Survey (Kinsman and Lamb 1953–1955b). These contain mostly songs, with a small amount of linguistic material, including some words and phrases, monologues, and traditional stories, by Elizabeth Bethel and Lucy Kinsman (from North Fork) and Tom Stone (from Fish Springs). The field notebooks, by contrast, contain linguistic material from a total of 37 speakers, distributed throughout all of his dialect areas (figure 4).<sup>1</sup> For the vast majority of speakers, then, the sole record of their speech is in Lamb’s notebooks. All the speakers he worked with are listed in table 2, along with the pages where their speech is represented.<sup>2</sup>

<Figure 4 here>

**Figure 4:** Approximate geographic extents of Lamb’s dialect areas and distribution of speakers in Lamb’s Mono field notes.

## 1.2. Methods

For this study, we transcribed all words and phrases in the 24 notebooks that were recorded in isolation (not in a sentence or text). Lamb’s transcriptions, which vary greatly from very narrow to broad, were normalized to a quasi-phonemic transcription, based on a transcription guide that he provided (B 94–98).

Generally, we use the IPA in our transcriptions, with some Numic-specific conventions. Lenis plosives are represented as single consonants (*b, d, g*), with fortis and voiced fortis plosives as doubled characters (*pp, tt, kk* and *bb, dd, gg*, respectively). When the distinction is neutralized (word-initial position), just a single character is used (*p, t, k*). The lenis-fortis contrast is represented for fricatives with just single characters (*z* vs. *s*) and for nasals by doubling (*m* vs. *mm, n* vs. *nn, ŋ* vs. *ŋŋ*). The Proto-Numic prenasalized series is represented by a homorganic nasal–consonant sequence, e.g. *mp* or *npj*.

These raw transcriptions were then compiled by speaker and organized into cognate sets. In our analysis below, we rely on Babel et al.’s (2013) reconstructions for Proto-Numic. If another authority was used, we cite it explicitly. We focused on sets in which three or more speakers were represented, so the residue may contain additional information that we have not examined.

The analysis presented focuses first on the evidence for Lamb’s dialect divisions, before considering other patterns of variation attested in the dataset. In general, we discuss all features that characterize a putative dialect grouping, without imposing any specific criteria about what ‘counts.’ We discuss what mechanisms might be at play for each feature (e.g. innovation, diffusion, retention, borrowing), in order to better understand the processes by which the diversity within Mono developed.

## 2. Smaller groupings

Lamb divides the Mono varieties spoken on the western slopes of the Sierra Nevada into three dialects, each with two subdialects. This grouping, which mirrors Kroeber’s (1925:585), is based geographically on the major drainages of the region. There is not sufficient data to thoroughly characterize each subdialect, though some features do cluster around each of the three major river basins.

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<sup>1</sup> Two unnamed individuals in the field notes, one from Northfork and one from Yosemite, may actually represent additional sessions with speakers identified elsewhere.

<sup>2</sup> Throughout, we refer to notebooks using the letter assigned by Lamb, using his original page numbering.

The San Joaquin River area is characterized by three properties. First, all speakers exhibit obstruentization, depalatalization, and fortition of the Proto-Numic prenasalized palatal glide *\*nj* to *t* in *\*tihinja* ‘deer’ and *\*pohninja* ‘skunk’ (AW, LK, MGM), as shown in figure 5A. Second, with the exception of HL, speakers have *tuna’a* for ‘pine nut’ (AW, LK, MGM), instead of *\*tiba* (Nichols 1974: 341). Finally, three speakers (AW, EB, LK) have Spanish borrowings for ‘bull’ and ‘sheep’, in which *r* has been adapted as *n*: e.g., *too’no’o* (from *toro*) and *ponnika’a* (from *borrego*) (C 22). MGM shares the form for ‘bull’, suggesting that this feature characterizes the San Joaquin River valley in general (though MGM has the Kings River form for ‘sheep’: see below).

<Figure 5 here>

**Figure 5.** Distribution of selected features: A shows reflexes of *\*nj* in *\*pohninja* ‘skunk’ and *\*tihinja* ‘deer’; B shows reflexes of *\*jw* in *\*paywi* ‘fish’; C shows reflexes of *\*mp* in *\*timpi* ‘rock’; D shows stem for the meaning ‘horse’.

In the Kings River basin, the two speakers (GD and KJ) for whom data is available exhibit a number of distinctive features. They, too, exhibit obstruentization and fortition of Proto-Numic *\*nj*, as in San Joaquin River, though there is no neutralization with *t*, as both have affricates, *ts* for KJ and *tf* for GD (figure 5A). Both speakers also have a unique form for ‘coyote’, which adds a formative to Proto-Numic *\*isa* (Nichols 1974: 320): e.g., *isa’abizi* for GD (S 90) and *ifa’abizi* for KJ (S 72). They also both have a distinctive stem for ‘green’: *puhizina-* (S 71, 90). Finally, KJ has borrowed forms for ‘bull’ and ‘sheep’ in which *r* adapted as *l*: i.e., *toolo’* and *puliikka’a* (S 72); there is no data available for GD.

At the same time, there are several features shared by KJ in Sycamore Valley with San Joaquin River, which differentiates his speech from GD’s speech. He has a stem for ‘black’ *tummu-* (B 66), parallel to forms for AW, LK, and MGM, while GD has a different stem, *toga-* (S 90). Similarly, KJ has *toonaa-* for ‘cloud’ (S 68), like AW and LK, while GD has *pagina-* (S 84). These cross-cutting features may have less to do with dialect structure than KJ’s personal history. Though Lamb identifies him with Sycamore Valley, he adds that KJ is ‘from Cold Springs,’ near Auberry (S 64).

We have found only one feature that uniquely distinguishes any speaker from the Kaweah River watershed. KE exhibits back vowel raising in *\*pojo* ‘road’ (Nichols 1974: 333): *puju* (S 98), though this should be taken with a grain of salt due to the scarcity of data from this area.

On the eastern side of the Sierra Nevada, Steward (1933: 236) observes distinct varieties at Owens Lake and Lone Pine, Independence, Fish Springs, Big Pine, Deep Springs Valley, and Bishop and Round Valley. Lamb divides Owens Valley into two groups, drawing the boundary just south of Bishop. Within Northern Owens Valley, Lamb recognizes two further divisions — Bishop and Round Valley vs. Benton and Long Valley — which makes a total of three northern groupings with Deep Springs/Fish Lake Valleys. While there is, as Steward observes, significant variation from community to community across Owens and adjacent valleys, we found little evidence for these particular groupings.

In particular, there are no features to support the smallest northern subdivisions beyond the loss of *\*w* in *\*awa* ‘horn’ in Deep Springs/Fish Lake Valleys (RH, MC). There is, however, one feature that groups all of Northern Owens Valley together: obstruentization and depalatalization of Proto-Numic *\*nj* to voiced fortis *dd* in *\*tihinja* ‘deer’ and *\*pohninja* ‘skunk’ (ED, JW, MIW, MYM) (figure 5A). For Southern Owens Valley, there are some suggestive clusters of features,

but the scarcity of data for Kaweah River makes distinguishing it from a hypothetical larger Southern dialect difficult.

In sum, on the western side of the Sierra Nevada, some evidence supports three dialect areas, while on the eastern side, there is little support for Lamb's smallest groupings. It may simply be that there is not a sufficient quantity of data to uncover them, though our analysis incorporated roughly 2,200 forms from 'eastern' speakers and 1,700 forms from 'western' speakers. The nature of the data may also matter; we have focused primarily on words and phrases, while Lamb was also potentially able to consider a broader range of linguistic material including larger morphosyntactic constructions. Another possibility is that, while there is significant variation across Owens Valley and adjacent areas, this has the structure of a dialect continuum, without the more discrete divisions that emerge to the west.

### 3. Larger groupings

Lamb posits three larger groupings: Northwestern Mono (San Joaquin and Kings Rivers), Northeastern Mono (Northern Owens Valley and Deep Springs/Fish Lake Valley), and Southern Mono (Southern Owens Valley and Kaweah River). We find isoglosses that support the geographic boundaries that divide these three regions, though only a small minority of these features demonstrate actual innovations. Below we discuss the evidence for each area in greater detail.

We should note at the outset that there is a series of changes with partially overlapping spatial patterns that do not align with Lamb's areas. While the prenasalized stops (*\*mp*, *\*nt*, and *\*ŋk*) show obstruentization that has diffused throughout the entirety of the region (Babel et al. 2013: 459), the prenasalized glides *\*ŋj* and *\*ŋw* show a parallel change only in specific geographic subareas. *\*ŋw* (e.g., in *\*paŋwi* 'fish') undergoes obstruentization in Lamb's Northeastern and Northwestern divisions, but retains its nasality elsewhere (figure 5B). By contrast, the spatial extent of obstruentization of *\*ŋj* (e.g., in *\*tihiŋja* 'deer' and *\*pohniŋja* 'skunk') includes all of Northwestern Mono and Northern Owens Valley as well; this change stops at the borders of Southern Mono, leaving a nasal *n* or *ɲ* there as well as in the Deep Springs/Fish Lake Valley area (figure 5A). Furthermore, the ancestral prenasalized consonants *\*mp*, *\*nt*, and *\*ŋk* have been collapsed with fortis stops across Northwestern and Southern Mono, a pattern that crosscuts the boundaries of the prenasalized glide obstruentization. These changes are not diagnostic of Lamb's largest grouping, though their intersecting isoglosses may have partially inspired them.

#### 3.1. Northwestern Mono

Northwestern Mono, comprising the San Joaquin and Kings River basins, is set apart from other varieties by a small number of phonological features, buttressed by suggestive patterns in a handful of lexical variants.

There are a number of phonological innovations that might distinguish Northwestern Mono as a subgroup. All speakers within the San Joaquin and Kings River basins exhibit fortition (following obstruentization) of Proto-Numic *\*ŋj* to *tt* in the north and *tsts* or *tʃtʃ* in the south (see section 3 and figure 5A). In addition, *\*ŋw* exhibits fortition to *kk<sup>w</sup>* across San Joaquin and Kings Rivers (San Joaquin: AW, LC, LJ, LK, MGM, MNM, SJ; Kings: GD, KJ), though only LP in Kaweah River also exhibits this change. Relatedly, though its historical source is not clear, a stem for 'rattlesnake' surfaces with medial *kk<sup>w</sup>*, e.g., *togokk<sup>w</sup>a* (B 91) throughout the San Joaquin River Valley (AW, LK, MGM, SJ) and in at least Sycamore Valley for Kings River (KJ). While

the absence of data from southern portions of the Kings River Valley and the Kaweah River Basin limits the inferences that can be drawn about the boundary between Northwestern Mono and a putative Southern Mono area, this corresponds to *w* in Southern Owens Valley and Deep Springs/Fish Lake Valley and voiced fortis *gg<sup>w</sup>* in Northern Owens Valley. Finally, ancestral *\*hɲ* in *\*ahɲa* ‘shoulder’ (Nichols 1974: 318) undergoes denasalization to *h* in Northwestern Mono (MGM, KJ, GD). However, a lack of evidence from Northern Owens River Valley speakers for this sound change makes it impossible to determine whether the change is indeed restricted to Northwestern Mono or whether, as with *\*ɲj*, obstruentization has occurred on both sides of the Sierra Nevada in the north.

A number of other features provide supporting evidence for the Northwestern Mono division proposed by Lamb. Proto-Numic *\*w* in *\*awa* ‘horn’ is retained as *w* (San Joaquin: AW, MGM; Kings River: KJ, GD), while it undergoes nasalization throughout the Owens River Valley (*ṽ*) and is lost entirely farther east. Several lexical items also show differences between Northwestern Mono and Northeastern Mono. Forms for ‘sun’ (San Joaquin: AW, LK, MGM, SJ; Kings: GD), ‘lion’ (San Joaquin: AW, HL, LK, MGM; Kings: GD), and ‘year’ (San Joaquin: AW, LK, MGM, SJ; Kings: KJ) exhibit clear patterns separating Northwestern Mono from Northeastern Mono and the Southern Owens River Valley. However, no data for these lexical items are found in the Kaweah River region, which is crucial for distinguishing whether the San Joaquin and Kings River Valleys fit better in a classification with three major dialect divisions (Northwestern, Northeastern, and Southern) or a more general two-way dialect split (Western and Eastern).

Other lexical items that exhibit distinctive variants in Northwestern Mono may shed more light on language contact involving San Joaquin and Kings River Valley communities than on dialect boundaries per se. One of these is the stem for ‘woodpecker’: Haynie et al. (2014) suggest that the *pannaattada* form found in the San Joaquin (LK, MGM, MP) and Kings River (KJ, GD) Valleys is related to the etymon *palaka* that has spread through Central California as a wanderwort, rather than representing an independent onomatopoeic coinage. The *azabana* form found in the Owens River Valley (MJW, MYM, TS) and other Numic languages may also have ultimately originated in this same network of lexical diffusion. The direction of individual borrowing events for ‘woodpecker’ terms is difficult to establish, but the phonetic details of each form can be used to identify general chains of borrowing or convergence through contact (Haynie et al. 2014). The ‘woodpecker’ forms found in Northwestern Mono varieties suggest a possible alternative route for *n*-medial variants of the ‘woodpecker’ etymon into the Great Basin through Mono. In contrast, the *hummunnuwa’a* form for ‘quail’ in Northwestern Mono (LK, MGM, KJ, GD) is phonologically distinct from the *tahnaakkaa*’ form found in Northeastern Mono, but clearly shows a resemblance to Yokuts *humnul* ‘quail’ (Vera & Clark 2002: 298) that is suggestive of direct borrowing.

### 3.2. Northeastern Mono

The Northeastern dialect division is characterized by a number of phonological retentions, as well as additional phonological and lexical patterns that tend to support either its border with the Southern Owens River Valley or with Northwestern Mono.

The Proto-Numic prenasalized stops (*\*mp*, *\*nt*, and *\*ɲk*) are retained as voiced fortis stops, e.g., *bb* (MIW, MYM, JW, ED, HA, IM, MC, RH) and *gg* (MIW, MYM, ED, JW, HA, IM, MC, RH), while they have been collapsed into the fortis series everywhere else (figure 5C).

Northeastern Mono is also set apart from other dialect areas in its retention of *\*hm* in *\*pahmu*

‘smoke’ (Nichols 1974: 331) (MYM, JW, HA, MC). Where evidence exists, we find *\*hm* > *m* in Northwestern Mono and Southern Owens Valley. While this is not diagnostic of Northeastern Mono as a subgroup, it lends support to the cohesion of this region as a dialect area.

Correspondences involving the Numic ‘sixth vowel’ also provide support for some of the boundaries that separate this purported dialect area from neighboring varieties. In addition to the five vowels shared by all Numic varieties, some have a sixth vowel whose phonetic value varies across individual words and speech communities: *ai* ~ *ei* ~ *e*; in some, it is merged with *a* or *i*. For instance, Northeastern Mono has a stem *pedaŋi* ‘below’ (MYM, JW, MC), whose first vowel corresponds to *a* or *ai* in the Southern Owens Valley (no evidence exists for this word on the western side of the Sierra Nevada). The postposition ‘in’ also shows a distinction along the geographic divide where Lamb places the Northern vs. Southern Owens Valley boundary. In Northeastern Mono, it is *-wee* (MYM, MIW, JW, RH) whereas in Southern Owens Valley, it is *-wii*. The *-wee* variant also surfaces in the northern San Joaquin River Valley, making it more useful for supporting an ostensible boundary with Southern Owens Valley than a divide between Northeastern and Northwestern Mono.

Lexical data paint a similar general picture. The presence of *puggu* ‘horse’ (< Proto-Numic *\*puŋku* ‘pet’) is the only lexical feature that reliably distinguishes Northeastern Mono from all other varieties (MIW, MYM, JW, IM) (figure 5D). Other lexical features support either Lamb’s boundary between Northeastern Mono and Southern Owens Valley or a divide between Northeastern and Northwestern Mono, but not both. An *s*-initial stem for ‘cottonwood’ (< Proto-Numic *siŋa-* ‘aspen’; Nichols 1974: 337) in the Northern Owens Valley (MYM, JW) and Fish Lake Valley (MC, RH) contrasts with *tiŋ<sup>w</sup>a-* in Southern Owens Valley (TS, AG), thus supporting the geographic boundary between these eastern groups; missing data in Northwestern Mono and the Kaweah River basin prevent comparisons with western groups. For the meaning ‘quail’, data is only available from Northeastern and Northwestern locations, as discussed in section 3.1. The *tahnaakkaa*’ stem is found in each geographic subregion of Northeastern Mono (MYM, JW, RH), contrasting with the possibly Yokuts-influenced stem *humnul* found in Northwestern Mono areas.

### 3.3. Southern Mono

There is the least evidence for Lamb’s Southern Mono grouping. This may be due to the sparsity of data from Kaweah River, as there were only four speakers documented, all with relatively few data points (see table 2). No innovative features were identified that are shared exclusively by Southern Owens Valley and Kaweah River, though this area is characterized by a few phonological retentions and lexical changes.

All speakers preserve a nasal for the Proto-Numic prenasalized palatal glide *\*ɲj* in *\*pohniŋya* ‘skunk’ or *\*tihiŋya* ‘deer’ (Southern Owens Valley: PP, TS HM, AG; Kaweah River: KE, LP) (figure 5A). A similar retention is found for the prenasalized labiovelar glide *\*ŋw*, which is maintained in *\*paŋwi* ‘fish’ (Southern Owens Valley: TS, HM, PP, AG; Kaweah River: KE),<sup>3</sup> *\*hiŋwa* (Southern Owens Valley: AG, TS, HM, PP, MRH), and in *watsiŋ<sup>wi</sup>* ‘four’ (Southern Owens Valley: AG, AJ, TS, HM, PP; Kaweah River: CO, KE, JO) (figure 5B).<sup>4</sup>

<sup>3</sup> Though, LP in Kaweah River has *pakk<sup>wi</sup>-*, as in Kings and San Joaquin Rivers. The primary source of information about LP’s dialect is a note by Lamb that according to GD, ‘Lucy Pete talks Waksaci’ (S 88).

<sup>4</sup> Babel et al. (2013: 460 footnote 21) distinguish *watsiŋ<sup>wi</sup>* ‘four’ from other words with *ŋ<sup>w</sup>* in Southern Owens Valley and Kaweah River. We see no reason to do so, as Lamb transcribes these forms equivalently.



For lexical features, speakers across the putative Southern Mono group have a Spanish borrowing instead of Proto-Numic *\*puŋku* ‘pet’: e.g., *kawaju* or *kabaaju* < Spanish *caballo* (Southern Owens Valley: PP, TS, HM; Kaweah River: KE, LP) (figure 5D). This is shared, however, with all of Northwestern Mono. Similarly, three speakers share a stem for ‘blood’ — *paŋŋ<sup>w</sup>a* (CO), *pɪiŋ<sup>w</sup>a* (TS), *paiŋ<sup>w</sup>a* (HM) — though this is shared with speakers across the Northeastern Mono group as well (MW, JW, ED, MC). While lexical changes do not characterize Southern Mono as a subgroup, they do suggest the effects of contact across the Sierra Nevada, at least between Kaweah River and Southern Owens Valley. In the next section, we discuss additional evidence that some of the dialect structure within Mono arose through trans-Sierra diffusion.

#### 4. Other patterns that crosscut Lamb’s dialect areas

The division between Northeastern and Southern Mono splits the Owens Valley into two parts. But the variation across Owens Valley and the adjacent valleys, may be better characterized as a looser, more gradient array of isoglosses, given the relatively uniform ecological conditions and connectivity of this area.

Variation in the voicing of alveolar sibilants is illustrative of these layered isoglosses. In Southern Owens Valley and the northern community of Bishop, there are voiced variants of *kuttuzi-* ‘dust’ and *pazugu* ‘water snake’ (ED, HM, TS), which contrasts with a voiceless variant found in Benton at the northernmost end of Owens Valley (MYM). In *k<sup>w</sup>azi* ‘tail’, however, the entirety of what has been called Northeastern Mono (MIW, MYM, IM, RH, JW, ED) exhibits a voiced variant, along with Fish Springs (TS), while a voiceless variant is represented in Independence (HM) and Lone Pine (AG) farther south in Owens Valley. Some lexical isoglosses also only characterize subparts of Owens Valley, dividing it south of Big Pine or Fish Springs. Stems associated with Northern Owens Valley areas for ‘white’ (*tosa-*) and ‘yellow’ (*oha-*) are also found in Big Pine (PP) and Fish Springs (TS); the northern Owens Valley stem *tsiia’a* ‘girl’ is found in Fish Springs (TS, MRH); and Proto-Numic *\*pahmabi-* ‘bear’ is found throughout Northeastern Mono (ED, JW, MC, MIW, RH) as well as in both Fish Springs (TS) and Independence (HM).<sup>5</sup>

Below, we discuss three larger-scale patterns operating in parts of Owens Valley: (i) between parts of northern Owens Valley and the San Joaquin and Kings River basins; (ii) between the Kaweah River watershed and parts of southern Owens Valley; and (iii) Deep Springs and Fish Lake Valleys and parts of southern Owens Valley. None conform to Lamb’s boundary bisecting Owens Valley south of Bishop, and all three point to broader patterns of diffusion, both within Owens Valley and nearby Deep Springs and Fish Lake Valley, as well as across the Sierra crest.

##### 4.1. Contact between San Joaquin and Kings River basins and northern Owens Valley

Several features are shared across the Sierras between San Joaquin and Kings Rivers and certain speakers in Northern Owens Valley. First, these regions share obstruentization of the prenasalized glides *\*nj* and *\*ŋw* (figure 5A). Second, there are several reflexes of what Nichols (1974:312) reconstructs as Proto-Numic *\*ŋ*: (i) *\*ŋ* > *m* in *\*oŋa* ‘salt’ for San Joaquin River (AW,

<sup>5</sup> Though biographic information is limited for several of the Southern Owens Valley speakers, TS of Fish Lake describes living in Bishop for some time before moving back south to Big Pine, making it possible that some of his forms are influenced by a Bishop variety, and more importantly demonstrating some mobility of individuals across the central region of Owens Valley.

MGM), as well as in MIW and MYM in Long Valley and Benton, respectively; (ii)  $*\eta > n$  in  $*so\eta o$  ‘lung’ for San Joaquin River (AW, LC, LK, SJ) and both MIW and MYM again; and, (iii)  $*\eta > n$  in  $*ta'\eta a$  ‘knee’ and  $*ni'\eta a$  ‘chest’ for all of Northwestern Mono (AW, GD, KJ, HL, KL, MGM, MNM, SJ) and just MIW in the Northeast. These velar nasals are preserved throughout the rest of Owens Valley without exception. Third, *nobi* ‘house’ has a lenis final feature in San Joaquin River: e.g., *nobiwee* ‘in house’ (AW and LK), which is shared by MYM in Benton. The rest of Owens Valley triggers either *k* as the first consonant of the postposition (RH),  $gg^w$  (MIW, JW), or  $\eta^w$  (PP, TS, HM). Fourth, alongside *puggu* ‘horse’ (< Proto-Numic  $*pu\eta ku$  ‘pet’), MYM has *kawaaju'u* (U 68), a Spanish borrowing found across Northwestern and Southern Mono, but nowhere else in Northern Owens Valley (see section 3.3, figure 5D). Fifth, MYM shares *paapi* ‘blood’ with San Joaquin (LK) and Kings River (GD), even though all other speakers have a different stem (see section 3.3).

One possible explanation for these patterns is trans-Sierra contact, and possibly acorn trade from western to eastern slopes more specifically. While Steward (1933: 246) describes acorns as being ‘of minor importance’ in the central Owens River Valley, Gifford (1932: 19) documents travel from North Fork across the summit in summer at Mammoth Peak to gather pinenuts, with groups taking acorns with them and sometimes staying in Owens Valley a year or two. Subsistence-related meanings are potentially revealing of contact patterns across the Sierra Nevada, given the biogeographic differences and cultural complexes that exist on either side of the Sierra crest (Gifford 1971, Haney 1992). An *e*-initial variant of Proto-Numic  $*akki-$  ‘mush’ is found generally in Northwestern Mono (ANF, LK, KJ), while an *i*-initial variant is found generally in Northeastern Mono (MYM, JW, RH). However, MIW has both variants, while AW in San Joaquin River has the *i*-initial variant. These patterns across the northern Mono-speaking areas contrast with the different form found in Southern Owens Valley: *aikkiba* (U 24) for TS in Fish Springs.

Alternatively, it is striking that these features are all shared with either MIW or MYM, but not other speakers in Northern Owens Valley, like JW (Round Valley) or RP (Benton). MYM told Lamb that her father may be Western Mono (U 82), though RP reports that her parents were from Benton and that her grandmother was from Western Mono (U 56). For MIW, Lamb records that Mrs. Harry Miller thought her grandmother was from North Fork (U 56). Lamb reports that MIW has two sisters, one of whom is MYM (J 14), although MIW was born and raised near Crowley Lake in Long Valley (J 22) and MYM was born and raised in Benton (U 61).

The kinship explanation may find some support in some unexpected features of one San Joaquin River speaker. LK shares two features with speakers on the eastern sides of the Sierra Nevada (i) *tabu'u* ‘cottontail’, found throughout Owens Valley, while all others in Northwestern Mono have a different stem, and (ii)  $*ai > a$  in *waha* ‘two’, while all other speakers on the western side of the Sierras either maintain a diphthong or raise ( $*ai > e$ ); the same monophthongization is found sporadically in Owens Valley (MIW and TS) and in Deep Springs/Fish Lake Valley. These two possible accounts may not, in the end, be so distinct if the prolonged stays on the eastern Sierra described by Gifford led to the familial relations recorded by Lamb.

#### 4.2. Contact between the Kaweah River basin and southern Owens Valley

Lamb hypothesizes that Kaweah River and Southern Owens Valley form a dialect group, though as we saw in section 3.3 relatively little evidence supports Southern Mono as a grouping. There were no phonological innovations that characterize these dialects (only two phonological

retentions), while the lexical innovations found across Southern Mono are also found in Northwestern Mono.

There are also several features that extend across Kaweah River (and possibly parts of Northwestern Mono) and just the southernmost section of Owens Valley including Lone Pine and Olancha. First, Proto-Numic *\*m* has lenited and denasalized to *w* in *\*tama* ‘teeth’ and *\*nimi* ‘liver’ (Nichols 1974: 330, 337) throughout Northwestern Mono (San Joaquin: HL, LK, MGM, MNM; Kings River: GD, KJ) and Kaweah River (CO), as well as for AG in Lone Pine: *tawa* ‘teeth’ (S 146) and *niwi* ‘liver’ (S 147). However, HM, MRH, PP, and TS farther north all preserve a nasalized variant. Second, a similar denasalization has taken place in the less easy to reconstruct ‘seven’, which is *taatstsiwi* for AG in Lone Pine and AJ in Olancha (S142–143), with similar forms in Kaweah River (CO, JO, KE), Kings River (GD, KJ), and San Joaquin (AW, EB, LJ, LC, LK, MGM, MNM). But the rest of Owens Valley has a nasalized form, either  $\eta^w$  (HM in Independence) or  $\tilde{w}$  (Southern Owens Valley: PP, TS; Northern Owens Valley: ED, JW, MIW, MYM, RP; Deep Springs/Fish Lake Valley: RH, MC).<sup>6</sup> Fourth, KE in Kaweah River has *inii* (S 100) and AG in Lone Pine has *inii* (S 149) for ‘bear’, while all other speakers have a stem beginning with *p*, e.g., *pahabitstsi* for LK (C 20), including HM and TS in Southern Owens Valley: *pahabitstsi* (U 21, 45).

These partially overlapping features suggest a role for contact spanning the two sides of the Sierra Nevada. Indeed, Steward (1933: 325) documents trails between the Kaweah River watershed and southern Owens Valley at Cottonwood Pass, just south of Lone Pine, as well as at Olancha Pass. There were other trans-Sierra trails farther north, but these connect to the Kings River basin at Independence and to the San Joaquin River basin at Bishop.

### 4.3. Features shared between Deep Springs and Fish Lake Valleys and Southern Owens Valley

While Lamb proposes Deep Springs/Fish Lake Valley form a dialect group with Northern Owens Valley, he suggests that there are features this variety shares with Southern Owens Valley. His notebooks provide evidence for several such features.

Two retentions are shared with Southern Owens Valley. First, Proto-Numic *\*nj* is preserved as a nasal, either *n* (HA) or *ɲ* (IM, MC, RH) in *\*tihinya* ‘deer’, as in Southern Owens Valley (see section 3.3), whereas *\*nj* > *dd* in Northern Owens Valley and *\*nj* > *tt* in San Joaquin River (figure 5A). Second, RH and MC have *togowa* ‘rattlesnake’, as in Southern Owens Valley (AG, HM, MJW, PP, TS); in Northern Owens Valley, the labiovelar glide has become voiced fortis: e.g., *togogg<sup>w</sup>a* (MIW and MYM).

There are a number of other features which are shared between Southern Owens Valley and only one or two individuals in Deep Springs/Fish Lake Valleys. In particular, RH has monophthongized and lowered what was most likely Proto-Numic *\*ai* in *mappata* ‘palm (of hand)’ (U 41), as Southern Owens Valley does (PP, TS); for the others in Deep Springs/Fish Lake Valley, *\*ai* > *e*: *mappeda* (HA, MC). Also, RH also has *paginapp(a)* ‘cloud’ (U 43), as in Southern Owens Valley (AG, HM, TS), while MC in Deep Springs/Fish Lake Valley has a different stem, *tonnobb* (U 99), shared with Northern Owens Valley (ED, JW, MYM). Finally, both RH and HA have a voiceless bilabial in *naa $\phi$ ai* ‘six’ (U 39, U 59), which parallels the form

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<sup>6</sup> The one exception is HA, who we identify with Deep Springs Valley. Lamb notes that he was born in Deep Springs and lived in Fish Lake Valley from age 1, but lived part time later in his life in Big Pine, attending school there as well (U 58). The only representative data point from Big Pine that we have is PP, who has a nasalized variant.

found throughout Southern Owens Valley (AG, AJ, HM, PP, TS); by contrast, MC has a voiced bilabial in the same stem: *naabahi* (U 96).

There were historically many routes connecting Big Pine and Bishop in Owens Valley with Deep Springs Valley and nearby Oasis at the southernmost end of Fish Lake Valley (Steward 1993: 325). But at the same time, both HA (see footnote 4) and RH spent significant time in Big Pine. While Lamb records that he was ‘born and raised’ at Oasis, he ‘went back and forth much between Oasis and Big Pine’ (U 39). It is perhaps unclear, in the end, whether these are stable dialect features or whether they should be attributed to ideolects of these two individuals.

## 5. Conclusion

Differences in terrain, ecology, and culture on either side of the Sierra Nevada may not have created a clear two-way dialect split, but they may nevertheless have shaped the character of smaller-scale dialect diversity. On the western slopes, we find some support for small dialect areas in Lamb’s notebooks, as he proposed, especially at the geographic scale of river basins. On the eastern slopes of the Sierra, divisions are somewhat less clear. From Lamb’s work with speakers along the Owens River and adjacent valleys, there was little evidence for the smallest grouping that he proposed, though there is certainly significant variation across the communities of Owens Valley.

Where Lamb’s larger dialect groupings are concerned, we found the strongest evidence for Northwestern Mono, which was characterized by a few innovations and a handful of other features. Less evidence was available for Northeastern Mono and Southern Mono, whose shared boundary bisects Owens Valley between Bishop and Big Pine. The presence of features, representing overlapping subparts of Owens Valley as well as the adjacent Deep Springs and Fish Lake Valleys, suggests that, on the eastern side of the Sierra, the dialect structure of Mono is more continuum-like. This pattern of overlapping and crosscutting innovations also characterizes the adjacent Timbisha and Shoshoni languages, where it is frequently attributed to patterns of migration and the ecological conditions in the Great Basin (Miller 1970). It is not clear whether the language diversification in Owens Valley can be attributed to similar factors.

This does not lead us, however, to adopt the oft-invoked Western Mono and Eastern Mono designations. While the scarcity of evidence for the Sierra-straddling Southern Mono division hypothesized by Lamb might make a simple dialectical division along the Sierra crest an appealing prospect, the evidence for this binary categorization is limited. There is, for instance, the *\*w* in *\*awa* ‘horn’, which is retained in the San Joaquin (AW, MGM) and Kings (KJ, GD) River basins, but nasalized (*ṽ*) throughout the Owens Valley (MIW, MYM, ED, TS, MRH, HM), and lost entirely in Fish Lake Valley (MC, RH). Or, Proto-Numic *\*miha* ‘moon’ (Nichols 1974: 328), which has been replaced by a new stem, e.g. *tawiwa* ‘moon’, throughout all varieties to the west of the Sierra (MGM, KJ, GD, LP), but preserved in all varieties to their east (MIW, MYM, ED, JW, MC, RH, AG, HM, PP, TS). Additional variation in words for ‘sun’, ‘lion’, and ‘year’ suggest a set of lexical isoglosses along the Sierra crest, though the absence of data for these three meanings from the Kaweah River Basin makes it difficult to determine whether these forms truly support an Eastern versus Western division. At any rate, this modest set of isoglosses that would characterize the putative Eastern and Western dialects is dwarfed by the number and complexity of isoglosses that cross-cut them.

Further, contrary to Kroeber’s view of the Sierra Nevada as a nearly impenetrable barrier to contact, section 4 lays out significant evidence of contact between Mono-speaking communities across high mountain peaks, which has shaped variation within the language. We found evidence

there of possible language contact across the Sierra Nevada in both the southerly and northerly areas of the Mono-speaking area, as well as between Southern Owens Valley and the areas across the White Mountains to the east. While some of this evidence might be shaped, in part, by individual life histories, it seems likely that at least some of it is indeed reflective of more stable, community-level contact.

It seems clear from this initial examination that the best description of the dialect structure within Mono will require more nuance than a two-dialect or even a three-dialect solution. Future analysis of available texts will add detail to this picture, potentially bringing the number and location of primary divisions into better focus. While our conclusions about what shape the map of Mono dialect diversity should ultimately take are thus tentative at this point, we hope the indexing and mapping of Lamb's field notebooks undertaken here will facilitate future use of these materials to investigate the linguistic diversity within Mono and other Numic languages.

**Table 1.** Mono language data in the Sydney M. Lamb Papers. The 'ID' refers to an Item Number in the Survey of California and Other Indian Languages at the University of California, Berkeley  
<Table 1 here>

<sup>a</sup>In many of the notebooks containing data from just a single speaker, that individual is not identified by name. We are assuming that these notebooks record meetings with Lucy Kinsman. None of the data they contain was used in the analysis for this paper, as it primarily comprised texts and sentence elicitation.

**Table 2.** The 37 Mono speakers represented in the Sydney M. Lamb Papers. 'Location' is a geographic location corresponding to where the speaker was raised through age 18, as described in Lamb's notebooks or determined by census or other public records. 'Data' is a count of the total data points that served as the input to our analysis; for many speakers, there is likely more data available though it is less readily analyzed (e.g., it is included in a text).  
<Table 2 here>

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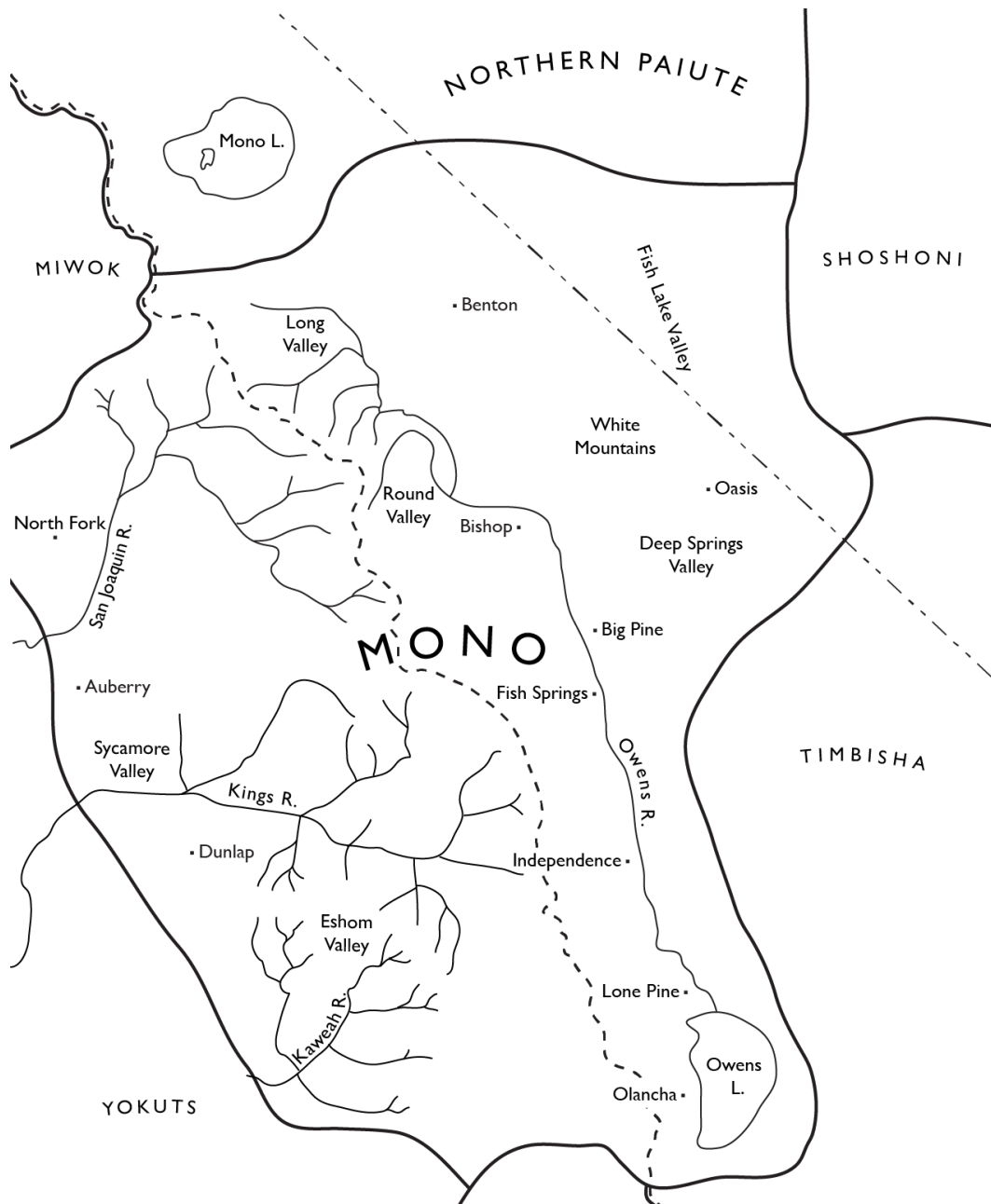
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Northwestern Mono  
  San Joaquin River  
    North shore (Northfork)  
    South shore (Auberry)  
  Kings River  
    North shore  
    South shore (Dunlap)

Northeastern Mono  
  Northern Owens Valley I (Benton and Long Valley)  
  Northern Owens Valley II (Round Valley and Bishop)  
  Deep Springs/Fish Lake Valleys

Southern Mono  
  Southern Owens Valley (from Big Pine to Owens Lake)  
  Kaweah River

**Figure 1.** Mono dialects according to Lamb (1957: 14–15)

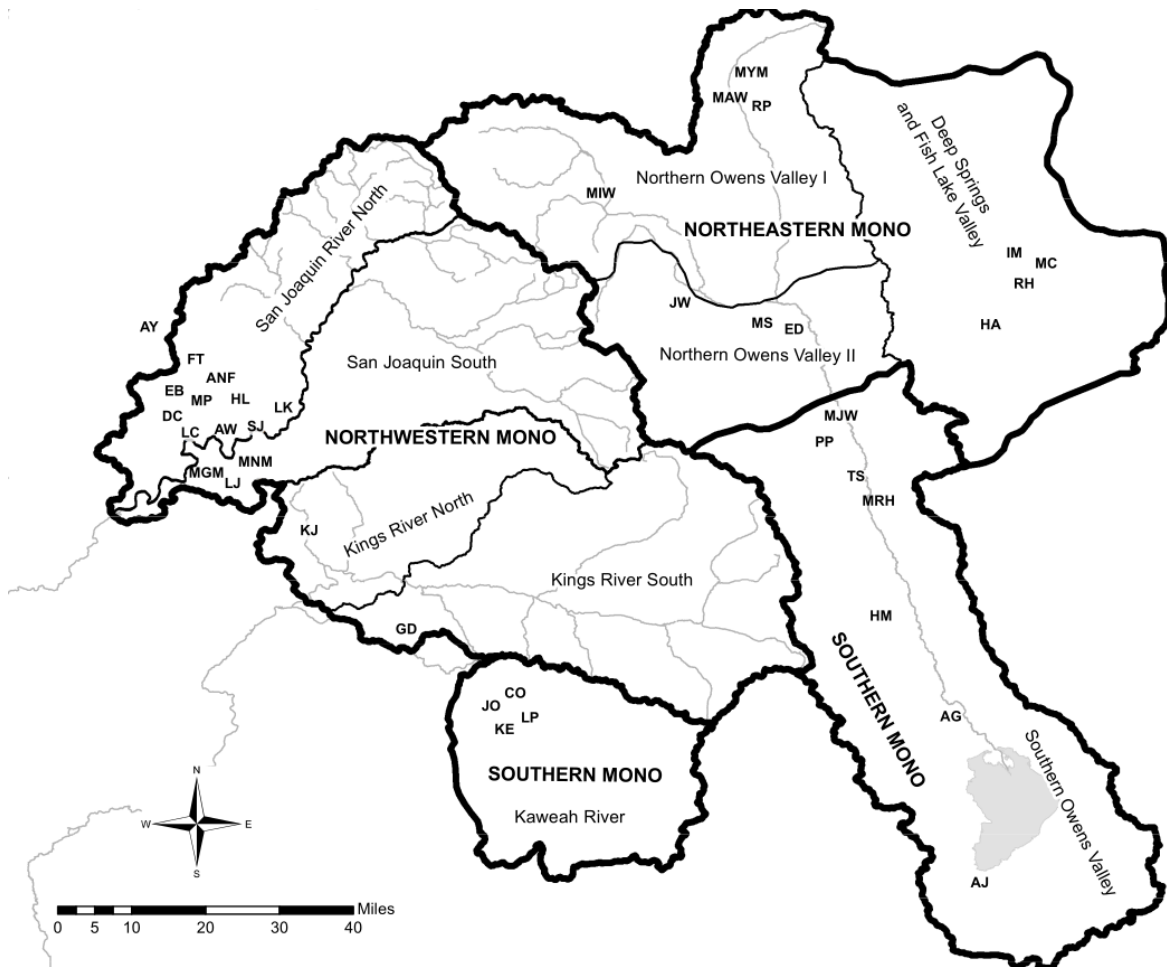


**Figure 2.** Mono-speaking areas (modified from Babel et al. 2013: 452)

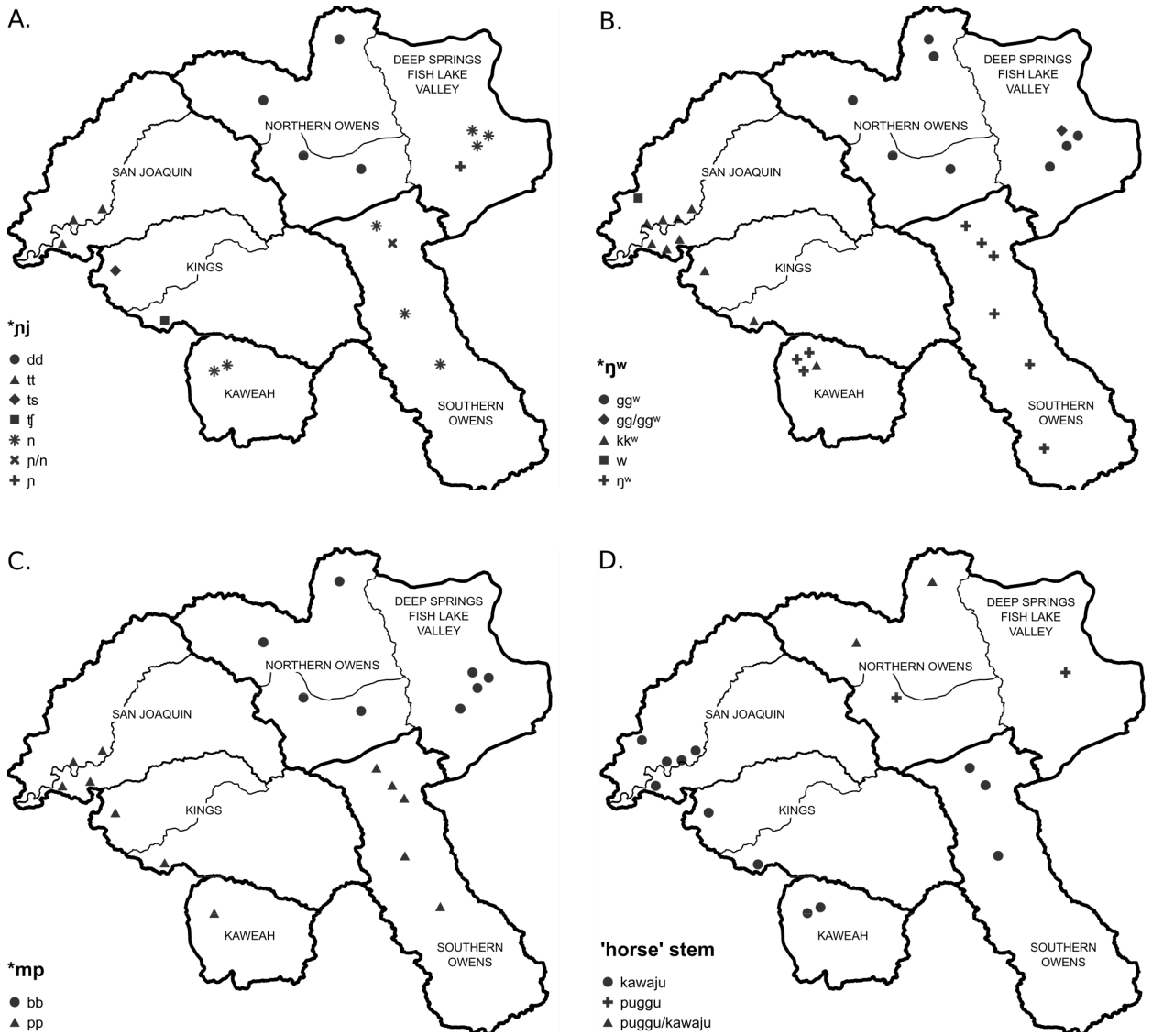


		siant <sup>ti</sup>	1
one	st <sup>mi</sup> ?	st <sup>mi</sup> ?	semé?
2	wahá:í ✓	wahá:í	
3	páhí: ~	páhí:ty	
4	wátsi kwítu		
5	wan <sup>gi</sup> ítu		
6.	<del>ta:tsi</del> wítu	napahítu	
7.	ta:tsi wítu ✓	ta:tsi wítu	
8.	wó:st <sup>w</sup> ítu ✓	wó:st <sup>w</sup> ítu	
9.	kw <sup>an</sup> kkítu		
10.	st <sup>i</sup> : si: wanóty	st: wanóty	
11.	st <sup>i</sup> : si: wanóty	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty
	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty
12.	"	wahama	"
13.	"	pahama	"
14.	"	wátsi kwíma	"
15.	"	wan <sup>gi</sup> íma	"
16.	"	napahíma	"
	"	ta:tsi wíma	
20.	wahá: wanóty		
21.	"	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty
30.	páhí: wanóty		
40.	wátsi wanóty		
50.	wan <sup>gi</sup> íwanóty		
60.	napahíwanóty		
70.	ta:tsi wíwanóty		
80.	wó:si wíwanóty		
90.	kw <sup>an</sup> kkíwanóty		
100.	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty	st <sup>i</sup> : wanóty

Figure 3. Page 1 from Notebook A, recording a meeting with Annie Wenz, in the Sydney M. Lamb Papers (Kinsman and Lamb 1953–1955b)



**Figure 4:** Approximate geographic extents of Lamb’s dialect areas and distribution of speakers in Lamb’s Mono field notes.



**Figure 5.** Distribution of selected features: A shows reflexes of *\*nj* in *\*pohniya* ‘skunk’ and *\*tihiya* ‘deer’; B shows reflexes of *\*ɲw* in *\*paɲwi* ‘fish’; C shows reflexes of *\*mp* in *\*timi* ‘rock’; D shows stem for the meaning ‘horse’.

<b>Notebook</b>	<b>Speaker(s)</b>	<b>ID</b>
A	Annie Wenz	Lamb.003.001
B	Susan Johnson, Kitt Joe, Lucy Kinsman, Hausen Lowell, Manda Marvin, Molly Pimono	Lamb 003.002
C	Lucy Kinsman <sup>7</sup>	Lamb.003.003
D	Lucy Kinsman	Lamb.003.004
E	Lucy Kinsman	Lamb.003.005
F	Lucy Kinsman	Lamb.003.006
G	Lucy Kinsman, Molly Pimono	Lamb.003.007
H	Lucy Kinsman	Lamb.003.008
I	Lucy Kinsman	Lamb.003.009
J	Lucy Kinsman, Frank Tex, Minnie Williams	Lamb.003.010.001
K	Lucy Kinsman	Lamb.003.011
L	Lucy Kinsman	Lamb.003.012
M	Lucy Kinsman	Lamb.003.013
N	Lucy Kinsman	Lamb.003.014.001
O	Bill Sherman, Lucy Kinsman, Gene Tulley	Lamb.003.015
P	Lucy Kinsman	Lamb.003.016
Q	Lucy Kinsman	Lamb.003.017
R	Lucy Kinsman	Lamb.003.018
S	Louie Carmen, George Dick, Kate Espinoza, Andrew Glen, Annie Jefferson, Kitt Joe, Lola Joe, Maggie Marvin, Crawford Osborne, Jim Osborne, Lucy Pete	Lamb.003.019
U	Harry Austin, Mimie Chiatovich, Emma Duckey, Rob Harry, Mrs. Rob Harry, Lucy Kinsman, May Meredith, Harry Miller, Ira Miller, Pike Piper, Rosie Piper, Maggie Spencer, Tom Stone, Minnie Williams, Jim Wright	Lamb.003.021
V	Elizabeth Bethel	Lamb.003.022

**Table 1.** Mono language data in the Sydney M. Lamb Papers. The ‘ID’ refers to an Item Number in the Survey of California and Other Indian Languages at the University of California, Berkeley (<https://cla.berkeley.edu>).

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<sup>7</sup> In many of the notebooks containing data from just a single speaker, that individual is not identified by name. We are assuming that these notebooks record meetings with Lucy Kinsman. None of the data they contain was used in the analysis for this paper, as it primarily comprised texts and sentence elicitation.

Speaker		Location	Source	Data	Speaker		Location	Source	Data
Harry Austin	HA	Deep Springs Valley	U 58–60	37	May Meredith	MYM	Benton	U 61–82	329
Elizabeth Bethel	EB	North Fork	V 94–103	120	Harry Miller	HM	Independence	U 1–13	207
Louie Carmen	LC	North Fork	S 1–15	115	Ira Miller	IM	Oasis	U 30–32	49
Mimmie Chiatovich	MC	Oasis	U 94–103	139	Crawford Osborne	CO	Eshom Valley	S 95–96	26
Daisy Coleman	DC	North Fork	V 103–105	7	Jim Osborne	JO	Eshom Valley	S 77	16
George Dick	GD	Dunlap	S 78–94	165	Lucy Pete	LP	Eshom Valley	S 91–93	24
Emma Duckey	ED	Bishop	U 83–88	70	Molly Pimono	MP	North Fork	B 38–47	12
Kate Espinoza	KE	Eshom Valley	S 97–100	56	Pike Piper	PP	Big Pine	U 33–38	105
Andrew Glen	AG	Lone Pine	S 143–155	203	Rosie Piper	RP	Benton	U 90–92	10
Rob Harry	RH	Oasis	U 39–56	228	Bill Sherman	BS	unknown	O 7–11	0
Mrs. Rob Harry	MRH	Fish Springs	U 39–56	41	Maggie Spencer	MS	Bishop	U 89	5
Annie Jefferson	AJ	Olancha	S 143–144	14	Tom Stone	TS	Fish Springs	U 14–29	267
Kitt Joe	KJ	Sycamore Valley	B 59–83, S 64–76	144	Frank Tex	FT	North Fork	J 86–94	63
Lola Joe	LJ	Auberry	S 44	10	Gene Tulley	GT	Auberry	O 1	0
Susan Johnson	SJ	North Fork	B 1–18	107	Annie Wenz	AW	North Fork	A 1–159	340
Lucy Kinsman	LK	North Fork	B 84–93, C 1–159	78	Minnie Williams	MIW	Long Valley	J 14–35, U 57	286
Hausen Lavell	HL	North Fork	B 19–37	56	Jim Wright	JW	Round Valley	U 104–116	194
Maggie Marvin	MGM	Auberry	S 45–63	189	Mrs. Jim Wright	MJW	Big Pine	U 104–116	10
Manda Marvin	MNM	Auberry	B 48–58	45					

**Table 2.** The 37 Mono speakers represented in the Sydney M. Lamb Papers. ‘Location’ is a geographic location corresponding to where the speaker was raised through age 18, as described in Lamb’s notebooks or determined by census or other public records. ‘Data’ is a count of the total data points that served as the input to our analysis; for many speakers, there is likely more data available though it is less readily analyzed (e.g., it is included in a text).