Yowlumne Yokuts (Penutian, spoken in California)

Yokuts was spoken around Kern Lake in the Central Valley (near Bakersfield).
There are three main branches of Yokuts with dozens of identified varieties. Only a few are still spoken today. Yowlumne (or Yawelmani) belongs to the Southern Valley branch; speakers currently reside on or near the Tule River Reservation at the edge of the Sequoia National Forest.

A	**aorist passive**	**aorist**	**future passive**	
1.	[xatit]	[xathin]	[xatnit]	‘eat’
2	[xilit]	[xilhin]	[xilnit]	‘tangle’
3.	[laːnit]	[lanhin]	[lannit]	‘hear’
4.	[ʂaːpit]	[ʂaphin]	[ʂapnit]	‘burn’
5.	[p’axaːtit]	[p’axathin]	[p’axatnit]	‘mourn’
6.	[hiweːtit]	[hiwethin]	[hiwetnit]	‘walk’
7.	[gopit]	[gophin]	[gopnit]	‘take care of an infant’
8.	[goːbit]	[gobhin]	[gobnit]	‘take in’
9.	[ʔopoːtit]	[ʔopothin]	[ʔopotnit]	‘arise from bed’
10.	[gijit]	[gijhin]	[gijnit]	‘touch’
11.	[meːk’it]	[mek’hin]	[mek’nit]	‘swallow’

We can identify the affixes as -it, -hin and -nit.
Alternations in the verb root involve long vowels and short vowels:

laːn ~ lan	goːb ~ gob	hiweːt ~ hiwet
ʂaːp ~ sap	meːk’ ~ mek’	ʔopoːt ~ ʔopot

The long vowel alternants all occur in the aorist passive, but not all aorist passive roots show the alternation, ex. xat-it and xat-hin or gop-it and gop-hin. This is suspicious and suggests that the long vowel is the underlying form because one needs to predict where it occurs.

We need to decide if this is vowel shortening or vowel lengthening.

Lengthening	V → Vː / ___ C V	(basically lengthening in an open syllable)
Shortening	Vː → V / ___ C C	(basically shortening in a closed syllable)

Lengthening falsely predicts that vowels will be lengthened whenever they are followed by a CV sequence, but this is incorrect: gopit, not *goːpit.
This means **Shortening is correct** – it predicts that long vowels should only be followed by CV sequences, and that is consistent with all the data.

Yowlumne has only a single consonant word-initially, so we can assume it does not allow complex onsets. Therefore, the word *xathin* would be syllabified as *xat.hin* (dot indicates syllable boundary), with the [h] in the onset and the [t] syllabified as a coda.
This means that for roots like /goːb/, when a consonant-initial suffix is added, the rime would have a CVVC structure. Yowlumne seems not to allow this (just like Egyptian Arabic), and so it

shortens the vowel. We can say that Vː → V / ___ C]$_{\sigma}$ (when the long vowel is followed by a coda consonant). When a vowel-initial suffix is added, the root-final consonant will syllabify as the onset of the following syllable, so the long vowel will be in an open syllable, which is licit: /goːb-it/ → goː.bit

B	**dubitative**	**gerund**	**imperative**	
12.	[paʔɬal]	[paʔiɬtaw]	[paʔiɬkʼa]	‘fight’
13.	[ʔamlal]	[ʔaːmiltaw]	[ʔaːmilkʼa]	‘help’
14.	[ʔilkal]	[ʔiliktaw]	[ʔilikkʼa]	‘sing’
15.	[sental]	[seːnittaw]	[seːnitkʼa]	‘smell’
16.	[lihmal]	[lihimtaw]	[lihimkʼa]	‘run’
17.	[ʂalkʼal]	[ʂaːlikʼtaw]	[ʂaːlikkʼa]	‘wake up’

There are three suffixes: -al -taw and -kʼa

These data show the same vowel length alternations as before – again we see long vowels in open syllables (seː.nit.taw) but not in closed syllables.

There are also vowel/zero alternations:

paʔɬ ~ paʔiɬ	ʔaml ~ ʔaːmil
ʔilk ~ ʔilik	sent ~ seːnit
lihm ~ lihim	ʂalkʼ ~ ʂaːlikʼ

The vowel that appears/disappears is always [i]. This suggests either that it is inserted (epenthesized) or that it is deleted.

Two possibilities:

Epenthesis (vowel insertion) Ø → [i] / C ___ CC

Deletion /i/ → Ø / V C ___ C V

A vowel would be inserted for syllable structure reasons: lihm-al → lih.mal poses no syllabification issues as the final root consonant can be the onset of the following syllable. However /lihm-taw/ has three consonants in a row. As Yowlumne does not have complex onsets and does not seem to have complex codas (all words end in a single consonant), this means that the three consonants cannot all fit into syllables: lih. m .taw – the [h] syllabifies as a coda and the [t] as an onset, but [m] is stranded. Epenthesis provides a vowel in order for it to syllabify: li.him.taw (following the syllabification algorighm, the [h] is the onset of the inserted vowel). So, we could rewrite the rule environment as C ___ C]$_{\sigma}$. (between two consonants at the end of the syllable)

As for deletion, this is a syncope rule in which a sequence of open syllables (V.CV.CV) is reduced by deleting the middle vowel, as was observed in Tagalog. In this case, however, it would be applied to a specific vowel [i]. The data are consistent with either epenthesis or deletion, so it is not easy to decide between them at this point. Let's examine some more data:

C	**aorist passive**	**aorist**	**future passive**	
18.	[panat]	[pana:hin]	[pana:nit]	'arrive'
19.	[ʔilet]	[ʔile:hin]	[ʔile:nit]	'fan'
20.	[hojot]	[hojo:hin]	[hojo:nit]	'name'

These are roots that appear to end in vowels. We see the same suffixes -hin and -nit as in data set A. However, the aorist passive is -t and not -it as seen before.
Furthermore, we see the same kinds of vowel length alternations as seen in the previous data sets, but the long vowels are appearing with the -hin and -nit suffixes here because there is no extra final root consonant that would cause shortening.

pana ~ pana:
ʔile ~ ʔile:
hojo ~ hojo:

The long vowel is appearing in an open syllable, as expected, but is shortening before a word final [t]. This is not the expected environment for shortening based on the rule environment we previously established of / ___ CC. We therefore have two very similar rule environments:

Shortening V: → V / ___ C C
Shortening V: → V / ___ C #

These can be collapsed as follows:

Shortening V: → V / ___ C {#, C}
where { , } is a disjunction of environments – either a C or a #

This type of environment is a very common one.

What we miss by writing the rule like this is that the rule environment is basically / ___ $C]_{\sigma}$ in both cases, that is, before a coda consonant. The coda consonant can be word-internal and followed by another consonant (/ʔa:ml-al/ → [ʔam.lal]) or at the end of the word: /pana:-t/ → [pa.nat])

As for the suffix alternation, we could either assume an additional deletion rule that deletes the [i] after a vowel (/pana: -it/ → [pana:t]) , or we could assume that the form of the suffix is actually /-t/ and that [i] is inserted when it attaches to a root that ends in a consonant. In other words, we can use our pre-existing epenthesis rule and modify it slightly. This epenthesis takes

place between two consonants at the end of the word, whereas the previous rule inserted a vowel between two consonants followed by another consonant:

Previous rule: Ø → [i] / C ___ C C
New rule: Ø → [i] / C ___ C #

Or put together: Ø → [i] / C ___ C {C, #}

This is the same as we did for vowel shortening

This is basically Ø → [i] / C ___ $C]_{\sigma}$

If a consonant would be found in the coda position, insert a vowel before it if there is a preceding consonant – in other words, don't allow complex codas.
We usually don't write the rules quite like this as we assume onset syllabification first and then codas last, but you get the idea.

The assumption that the underlying form of the suffix is /-t/ allows us not to complexify the analysis by adding an additional vowel deletion rule, and it just requires a tweak of our earlier epenthesis rule. This lends support to the idea that the vowel/zero alternations are due to epenthesis rather than deletion.

Finally we can determine the order of the two rules by doing a derivation. The long vowels will be in the underlying form because they may be shortened. The epenthetic vowels are not included in the underlying form either

Underlying form	/meːk'-t/	/meːk'-hin/	/seːnt-taw/
Epenthesis	meːk'it	--	seːnittaw
Shortening	--	mek'hin	--
Surface form	[meːk'it]	[mek'hin]	[seːnittaw]

Epenthesis applying first prevents shortening from affecting the long vowel in meːk'it. This is a **bleeding** order. For meːk'hin, the structural description of epenthesis is not found (a sequence of CCC word-internally), so epenthesis cannot rescue the syllabification of CVVC in this form. As a result, shortening applies. If the rules had applied in the opposite order, the wrong result is found:

Underlying form	/meːk'-t/	/meːk'-hin/
Shortening	mek't	mek'hin
Epenthesis	mek'it	--
Surface form	*[mek'it]	[mek'hin]

The incorrect order would be **counterbleeding**. The output has a short vowel even though it is in an open syllable (one asks 'why has the shortening rule applied?').
Note that for the [mek'hin] form, however, the rules are not crucially ordered because epenthesis never applies to this form as the environment is not met.

Complications

One question that could be raised is whether the suffixes are /-ht/ or /-nt/ and their [i] are inserted, too. We need to recognize that just because a vowel is epenthetic in some environments doesn't mean every instance of it in the language is. Since [hit] and [nit] don't show any alternation, it is better to assume that what you see is what you get.

Nevertheless, if they did lack a vowel, could our rules put the vowel in the right place? They specify C_CC and C_C# but not CC_C#
Since the vowel is between the [h] and the [n], we would need the C__C# to take precedence over the C __ CC environment. Our current rule-writing format doesn't have a means to do that. Putting the two environments together does not achieve what we want as it's ambiguous as to where to put the vowel: (C)C __ C{C,#}. So better to avoid this issue and assume /-hit/ and /-nit/.