### Evaluation Brief EB16 Selinda Research Associates, Inc. July 6, 2008 == DRAFT ==

### June 2008 Off-Site Testing of TAT Markers, MT Waysides, and Magic Meter

The waysides are really starting to come together, and in general the prototype signs seem to be working pretty well. Following are recommendations from three weeks of off-site testing of (a) TAT markers; (b) MT waysides (6my; 70my; 270m; and the Magic Meter); and (c) TAT waysides (10ya; 1,000ya; 20,000ya; 200,000ya). The recommendations are based on the results of that testing and include suggestions for prototypes at the rim, not necessarily final designs.

The following recommendations are divided into two sections. The first section is for Karl, and focuses on two TAT wayside signs (20,000ya; 200,000ya) that need significant input/development by the content team. Also included are a few additional questions/issues related to other waysides.

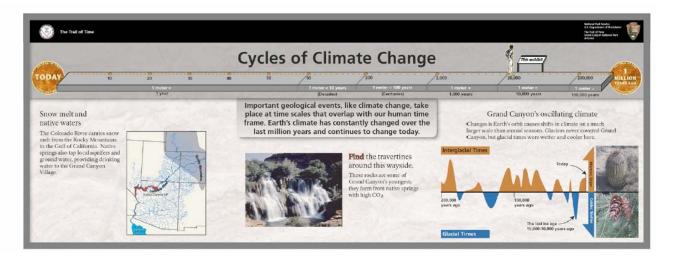
The second section is for Mark, and focuses on design revisions/challenges that surfaced during the off-site testing. They include mostly minor revisions to (a) the TAT markers; (b) four MT waysides (6my; 70my; 270m; and the Magic Meter); and (c) two TAT waysides (10ya; 1,000ya). These markers and six wayside prototypes will need to get final sign-off from Karl before being printed.

Here's the process we're recommending:

- 1. Deborah provides recommendations (this brief) to Mark (and the group) by July 7<sup>th</sup>.
- 2. Mark makes revisions outlined below. (July 7-13) and sends to Karl (July 13<sup>th</sup>).
- 3. Karl and the content team (a) work on outstanding wayside development and (b) sign off on final draft of prototypes Mark worked on. Karl sends Mark any final changes (July 15<sup>th</sup>).
- 4. Mark makes final revisions (by July 16) and sends to Deborah and Karl for identification of any Fatal Flaws (July 17<sup>th</sup>).
- 5. Karl/Mark/Ryan produce prototypes for the on-site testing (July 20<sup>th</sup>).

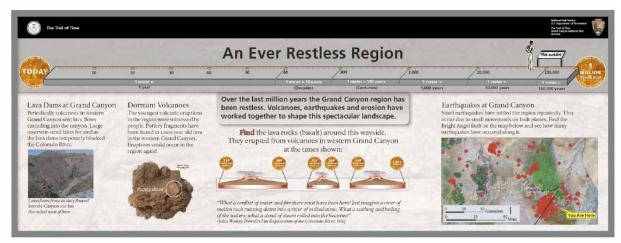
## FOR KARL

# 20,000ya – Cycles of Climate Change



- ~ Headline/Title
  - Suggested title: ?? Grand Canyon used to be cool and wet.
- ~ Rest of the sign
  - What is the main message? It's unclear.
  - o Good amount of text, except for the large amount of text in the middle grey box.
  - o Good relationship of graphics-to-text.
- ~ Grey box in middle
  - Shorten/clarify
- ~ Snow melt and native waters
  - o It's not clear what this section has to do with the rest of the panel.
  - o Perhaps emphasize seasonal cycles in river flow with more canyon carving during high flow?
  - Perhaps move the "native waters" piece of this label to the travertines label since the native waters are what makes travertine.
- ~ Find the travertines
  - o It's not clear what this section has to do with the rest of the panel.
  - Replace photo, unless this looks like what visitors will actually be finding/seeing.
  - Perhaps the photo here could show growth layers in the travertine, corresponding to multi-year cycles of drought and wetness (assuming that's what they really correspond to).
  - Make sure there is a hunk of travertine that is part of the wayside like the river polished rock (6my), and the fossil rock (270my).
- ~ Grand Canyon's oscillating climate
  - o Remove/replace word "oscillating."
  - Flip the Interglacial/Glacial graph to have Today at left and 200,000ya at right so it lines up with the timestrip.

## 200,000ya – Ever Restless Region



- ~ Headline/Title
  - Suggested title: Earthquakes and volcanoes happen frequently in the Grand Canyon, or perhaps something like "What you see today happened a long time ago."
- ~ Rest of the sign
  - What is the main message? It's unclear.
  - There's too much text throughout the sign.
  - Move the earthquake piece to the left as (a) earthquakes are more common than volcanoes, and (b) they are precursors to volcanoes.
  - For many visitors, this will be the first time (and for some the only time) they see anything about the forces that formed the canyon, but there is nothing here about the role of the Colorado River. We have found over and over that visitors want a large catastrophic event (like earthquakes and volcanoes) to be what formed the Grand Canyon. We need to make sure we aren't reinforcing that notion with this wayside panel.
- ~ Grey box in middle
  - Shorten/clarify.
  - Replace: "Volcanoes, earthquakes, and erosion" with something like "As the Colorado River carved the Grand Canyon, earthquakes shaped its path, and volcanoes sometimes blocked its flow" (see above).
- ~ Lava dams at GC
  - Label important components of the photograph. For example issues respondents had were that it's not clear what is the "lava flow" or the "lava dam." And is the cone shaped mound at the top a volcano?
- ~ Dormant volcanoes
  - o Revise label in photograph: "Pottery shard in lava rock."
- ~ Find the lava rocks
  - Flip that time scale so it lines up with the timestrip.
  - Include a photograph of what a "lava rock around this wayside" will look like. Visitors are amazingly good at coming up with the wrong answers.
  - Give the diagram a title to reinforce the cyclic nature of volcanic eruptions, e.g. something like "Cycles of volcanic activity" or "When volcanoes occurred in Grand Canyon."
- ~ Earthquakes at Grand Canyon
  - Replace the satellite image with a more familiar park map, for example from the brochure. Respondents had a lot of difficulty with this type of image.
  - Make scale key smaller, and add a simple key:  $\bullet$  = earthquake

# **Additional Questions/Issues**

- ~ 1,000ya: Native Peoples
  - This is just a question I have. It says "Split twig figures have been found in caves and ancient trail markers..." What are the *ancient trail markers* where split-twig figures have been found?
- Check with Judy about what to call native peoples/Native Americans on the Magic Meter and the 10,000ya TAT wayside. Also confirm spelling and capitalization, e.g. should Indian be capitalized in Paleo-indian, etc.
- ~ Magic Meter & Native Peoples
  - There is nothing on these signs—or for that matter anywhere along the ToT—that mentions the people who live in Grand Canyon today. On the Magic Meter, consider having Mark make the four photographs smaller, and adding a fifth to the far right depicting native peoples living here today, or even a montage of different native people groups and park employees. On the Native People's sign, we've already addressed this by saying "Native peoples have lived at the Grand Canyon for many thousands of years, and continue to live here today."
- When you receive materials back from Mark, these items in particular may have content implications and need your review:
  - o 10ya: It's About Time

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- Title/main heading
- Time's Cycles text
- 1,000ya: Native Peoples
  - Title/main heading
  - Revision of *Extinction* paragraph
- o 70my: Uplift & Erosion
  - 3-step diagram and accompanying text

# FOR MARK

# **TAT Markers**



## **Recommendations:**

For the on-site testing use prototype markers in the format of the lower set, i.e. with numbers (B-markers) rather than the word THOUSAND (A-markers). Most respondents indicated that B-markers were more impressive – "Wow, that's a big number." "It's cooler." – and there was strong evidence that with A-markers visitors will likely read *ninety*, *one hundred*, *one hundred* and *ten*, rather than *ninety-thousand*, etc.

## All Wayside Signs

### **Recommendation:**

For all wayside and interpretive material, whenever a rock layer is mentioned, include the pronunciation.
 We found that many respondents continued to struggle with the pronunciations and appreciated having the guide right there when they needed it.

## **MT Wayside Integration Strip**



### Recommendations for timestrips across the top of all MT waysides:

- $\sim$  Change the color(s) so there is greater contrast between the strip and the background.
- ~ Remove the drawing of the exhibit. This proved to be distracting/confusing for respondents.
- ~ Add a "you are here" bubble that moves along the timeline depending on the wayside. Some respondents did not connect the text to the time on the marker.
- ~ Treat the "main message" statement as a heading.
- ~ Add more "pictures" of single-celled and early animals sprinkled below the timeline. Some respondents associated the pictures with a specific time.
- Add a comma to 2000my marker on the left. Some respondents consistently read this number incorrectly, e.g. 200 instead of 2,000.
- $\sim$  Make the numbers on the timestrip vertical rather than oblique to make them easier to read at a glance.
- ~ Replace "WHAT lived on Earth?" with "What lived on Earth?"

# 6my – Carving the Canyon

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#### Recommendations

- Revise title: It took 6 million years to carve the canyon. The existing title was confusing for respondents as it included too many concepts. "I have to think [too hard] as I read it."
- Eliminate the graphic on the left for now. Most respondents were confused by this: "I don't know what the purpose of that is." "I don't know what it is." "I don't have a clue." "I have no clue." For most of those that were able to understand it, it didn't appear to enhance their experience: "It kinda doesn't say anything. It's kinda worthless."
- ~ "Carving the Canyon" s/b "carving the canyon."
- ~ Replace 10my marker that girl in illustration is stepping on with 6my marker.
- ~ Replace the river polished rock text with: "Touch a river polished rock. This rock, brought from deep in Grand Canyon, was shaped and eroded by the powerful Colorado River over millions of years."
- ~ "Find the River" s/b "Find the river."

## 70my – Uplift and Erosion

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EROSION Visualize the rocks stripped awa	The Grand Canyon region was near sea level until 60-70 million years ago. It is now over 1.6 km (one mile) above sea level and actively eroding.	<section-header><section-header><section-header><section-header></section-header></section-header></section-header></section-header>

### Recommendations

Overall

- ~ Switch the Uplift and the Erosion sections.
- $\sim$  Remove the graphic on the left. It had the same problems as the one on the 6my sign.
- ~ Eliminate the map in the middle of the sign.

- Remove the box of text in the middle. Preliminary data indicated that it's redundant. We need to test
  this at the rim.
- Change the title to: "Without uplift there would be no Grand Canyon." We tested the original version (above) as well as the suggested revised version. The revised one resonated more with respondents. One respondent explained that with the original one "It's hard to talk and make sense of it." Another respondent said "[The revised heading] is more striking. When I read that [the original one] I'm like 'Okay, who cares?"

### Uplift

- Draw a 3-step diagram to explain uplift. We tested a number of versions of the uplift diagram and having the three steps helped respondents visualize it as a process that took place over millions of years. The drawing used should be a slight revision of the final one we tested.
  - Be sure the following are labeled on the 3-step diagram:
    - o sea level
    - o Kaibab (KIE-bab) Limestone
    - o plate movement
    - o Colorado Plateau and Rocky Mountains
    - o Pacific Ocean
- ~ Include the following text to explain uplift:
  - Many millions of years ago, rock layers formed, one on top of the other.
  - From 70 to 60 million years ago, the whole area lifted up high above sea level.
  - For almost 60 million years, erosion wore away the upper rock layers, leaving the Kaibab (KIE-bab) Limestone exposed.
  - The high elevation set the stage for the carving of the Grand Canyon.

### Erosion

- $\sim$  Get a better photograph without shadows. This is imperative for the on-site testing.
- ~ Revise text: Erosion has stripped away layers of rock younger than 270 million years old, including those with dinosaur fossils.

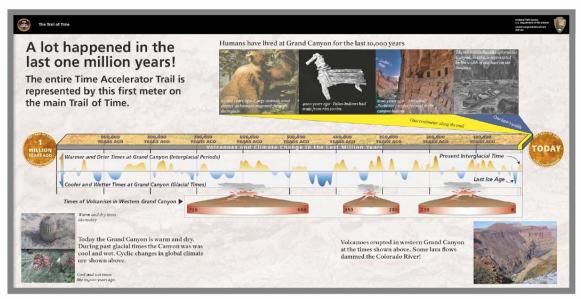


# 270my – Horizontal Layers

#### Recommendations

 Remove the mnemonic. Few respondents noticed it, and when they did, it didn't help them make sense of things. This needs to be moved to the walking guide so that people have it available as they walk the trail.

- ~ Add pronunciations every time a rock layer is named.
- ~ Remove the label Supai in the rock layer photograph.
- Under Look across the canyon. Revise the text: "The Kaibab (KIE-bab) forms the top layer on both canyon rims. This layer was continuous before the Colorado River carved the canyon".
- Use smaller (and same-sized) text to label the rock column on the left: Horizontal Layers; Grand Canyon Supergroup; Basement Rocks.
- Under Find the Kaibab Limestone: Replace "The rock layer you are standing on is 270 million years old" with "You are standing on a rock layer that is 270 million years old."



## **Magic Meter**

- ~ Replace text "The entire Time Accelerator Trail..." with "The entire Million Year Trail ( $\rightarrow$ ) ....".
- ~ Replace "Interglacial Periods" (on the left) with "Interglacial Times."
- ~ Remove extra "was" at the end of the line "During past glacial times the Canyon was was..."
- ~ Remove text: "Cyclic changes in global climate are shown above."
- Replace "Times of Volcanism in Western Grand Canyon" (on the left) with "Times of volcanism in western Grand Canyon."
- ~ Change captions in photographs:
  - 10,000 years ago: Native peoples arrived in the region. At about the same time, large animals went extinct. [NOTE: We're using the terms *native peoples* and *Native Americans* as a place holder until we get the Park's official wording.]
  - o 4,000 years ago: Native Americans had trails from rim to rim.
  - o 1,000 years ago: Native Americans farmed in the canyon bottom.
  - o 150 years ago: Powell explored the Grand Canyon.
- Far left text at bottom. Replace "Cyclic changes in global climate are shown above" with "Global climate cycles are shown above."
- ~ Good use of repeated photographs from TAT waysides.
- During the on-site testing, it will be imperative that visitors readily make the connection between the one million years on this wayside and the first meter of the Main Trail of Time. Mark, can you come up with some solutions to this challenge?
- ~ Get from Karl labels for the bottom right-hand photograph which he is developing as part of 200,000ya.



### **Recommendations:**

- ~ Replace MT markers at each end of timeline with TAT markers.
- ~ Change the color(s) so there is greater contrast between the strip and the background.
- ~ Remove the drawing of the exhibit. This proved to be distracting/confusing for respondents.
- ~ Add a "you are here" bubble that moves along the timeline depending on the wayside.
- ~ Include 1 meter = 1,000 years (Millenia), similar to decades and centuries.
- ~ Add millennia.

# 10ya - It's About Time

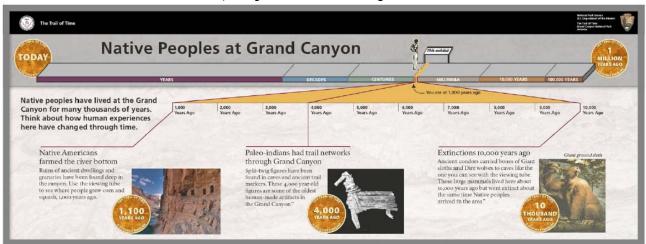


- ~ Headline/Title
  - o Suggested title: It's About Time.
- ~ Time's Cycles
  - Remove the red bolding in the heading. Red bolding refers to an action verb.
  - Suggested rewrite of text, keeping the photograph:
    - We are all familiar with nature's cycles: day and night, the four seasons, the phases of the moon. On a much larger scale there are geologic cycles too: climate changes, and times when there are lots of earthquakes. Native Americans depicted these cycles with spirals such as this photograph of a petroglyph.
- ~ Time's Linear Progression
  - Replace "~" with "about" e.g. A human lifetime is about 80 years. Etc. Some respondents didn't know what the ~ symbol meant.
  - o Replace Oldest GC rock/... with "Oldest Grand Canyon rock is about 2 billion years old."
  - Make the decimal point in 4.56 larger. Respondents missed it, reading it as 456 billion instead.
  - Remove the red bolding in the heading. Red bolding refers to an action verb.
- ~ Find your age
  - o Draw a new illustration showing people of different ages standing on different markers.
  - Replace text: Walk to the marker that shows your age. What happened before you were born?
- ~ Walk a million years.
  - Remove entire paragraph.

- ~ What is a million?
  - Correct the font. The 1 looks like an I and hangs out at the end of the line. It created significant confusion among respondents.
  - Remove the red bolding in the heading. Red bolding refers to an action verb.

## $\sim$ The middle gray box

• Replace the text: To humans a million years seems unimaginably long, more than 10,000 lifetimes. This trail helps you make the shift from human to geologic time.



## 1,000ya – Native People's

- ~ Headline/Title
  - o Suggested title: People have been in Grand Canyon for 10,000 years.
- ~ Overall
  - Replace MT markers with TAT markers.
- ~ Large paragraph to the left
  - Revise text: Native peoples have lived at the Grand Canyon for many thousands of years, and continue to live here today. Think about how human experiences here have changed through time.
- ~ Native Americans farmed the river bottom
  - o okay for testing
- ~ Paleo-indians had trail networks
  - Should "Indians" be capitalized? Or replace with Native Americans for now.
- ~ Extinctions 10,000 years ago
  - Revise heading: Native peoples arrived in Grand Canyon.
  - Revise text: Look through the viewing tubes to see some caves. Until about 10,000 years ago ancient condors carried bones of giant sloths and Dire wolves to caves like these. Then many of these large mammals went extinct, at about the same time that Native peoples arrived in the area.