

National Park Service  
U.S. Department of the Interior  
Yellowstone National Park



# Winter Use Adaptive Management Plan

## Soundscapes

EXPERIENCE YOUR AMERICA



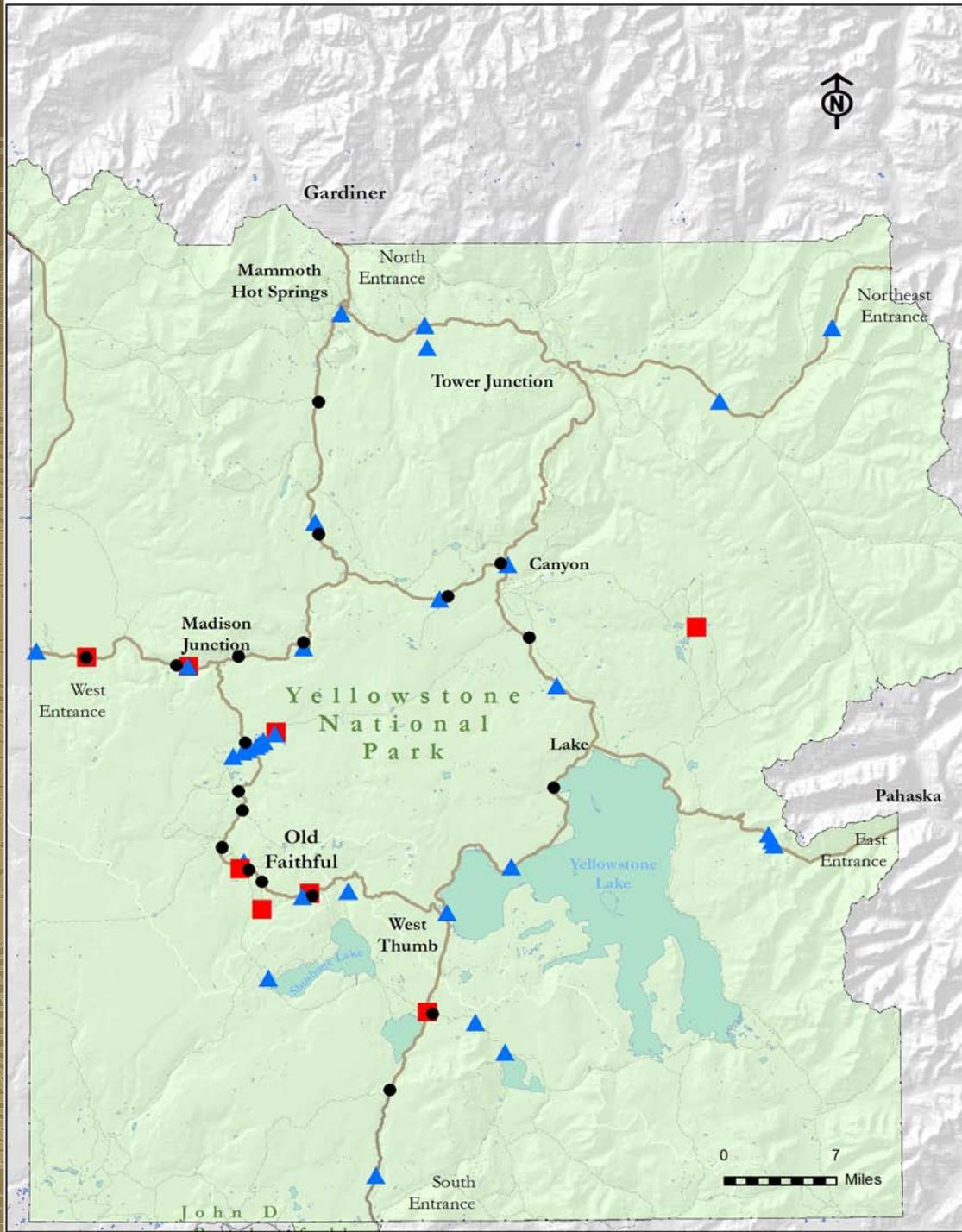
# Soundscapes: Summary of Science

- Extensive research and monitoring since 2003: available park website, \$35K/yr
- 42 sound monitoring locations (developed areas, travel corridors, backcountry)
- OSV are audible about 50% of the day along the busiest corridor
- OSVs can often be heard up to 5 miles from travel corridors



# Soundscapes: Summary of Science

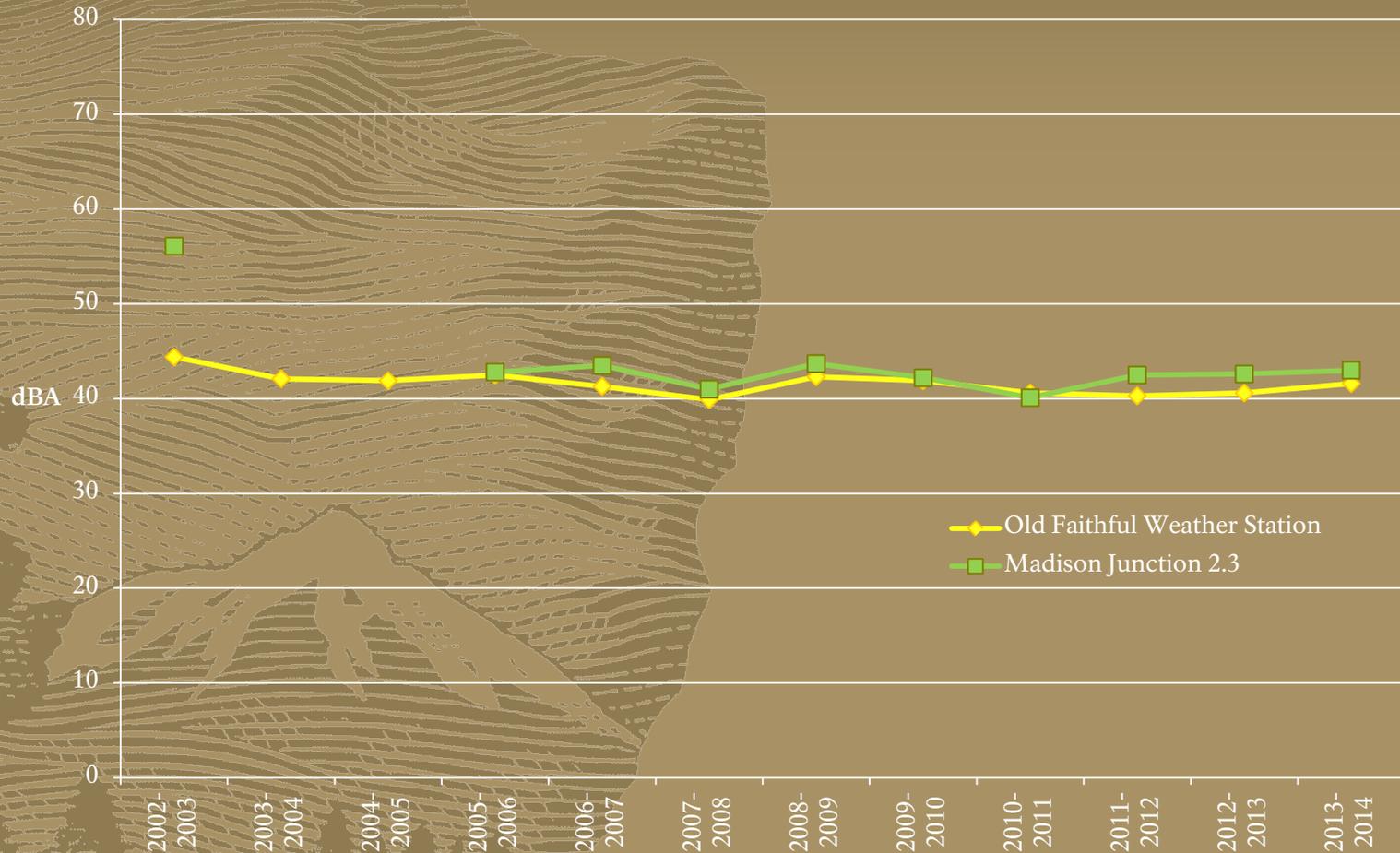
- Snowcoaches are currently the loudest and quietest OSV
- Groups of snowmobiles and individual snowcoaches have similar % time audible as measured near roads
- Groups of snowmobiles and individual snowcoaches emit similar noise levels and % time audible as calculated at distance

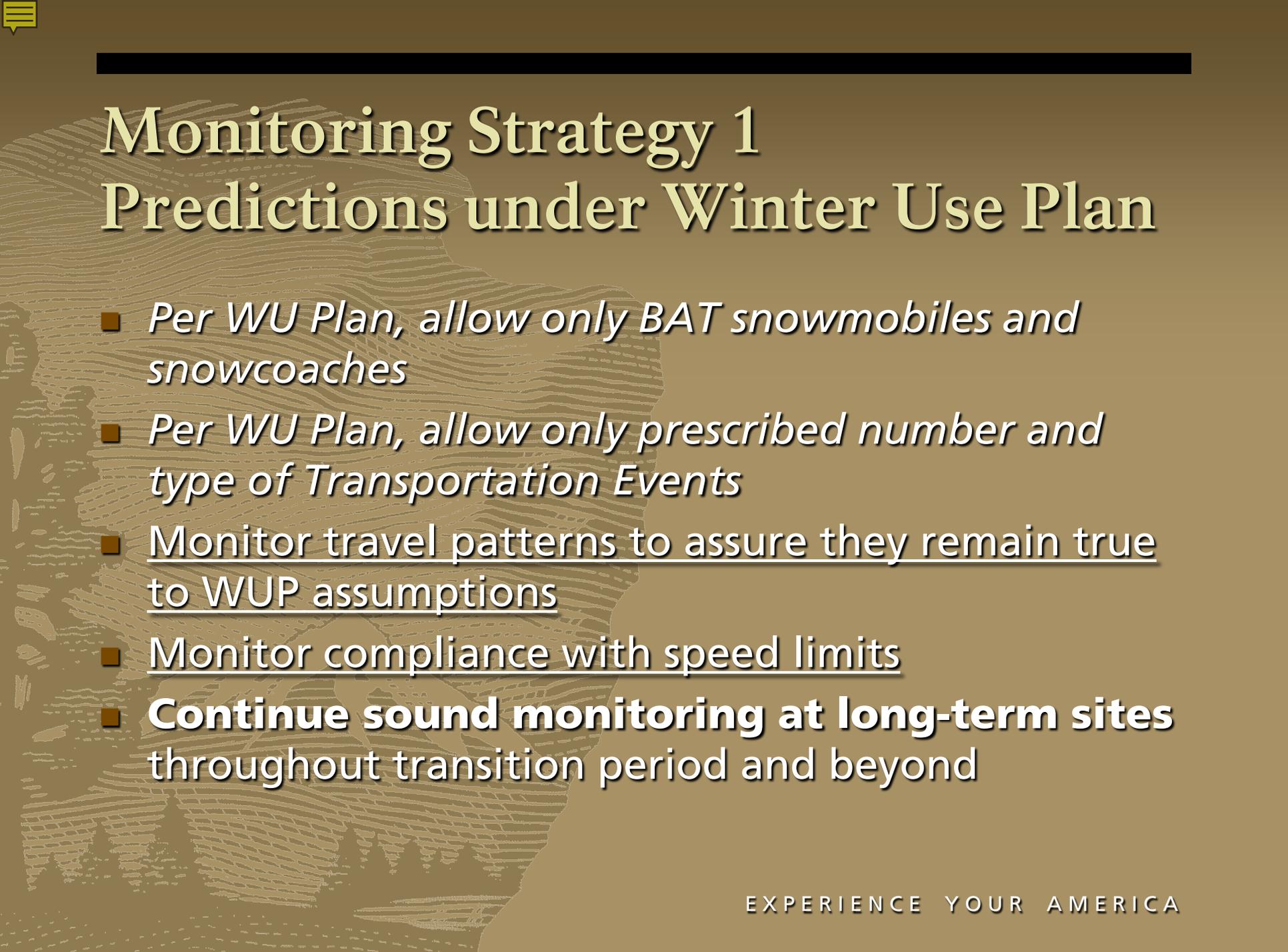


# Percent Time Audible



# Sound Level Equivalent ( $L_{eq}$ = energy average)

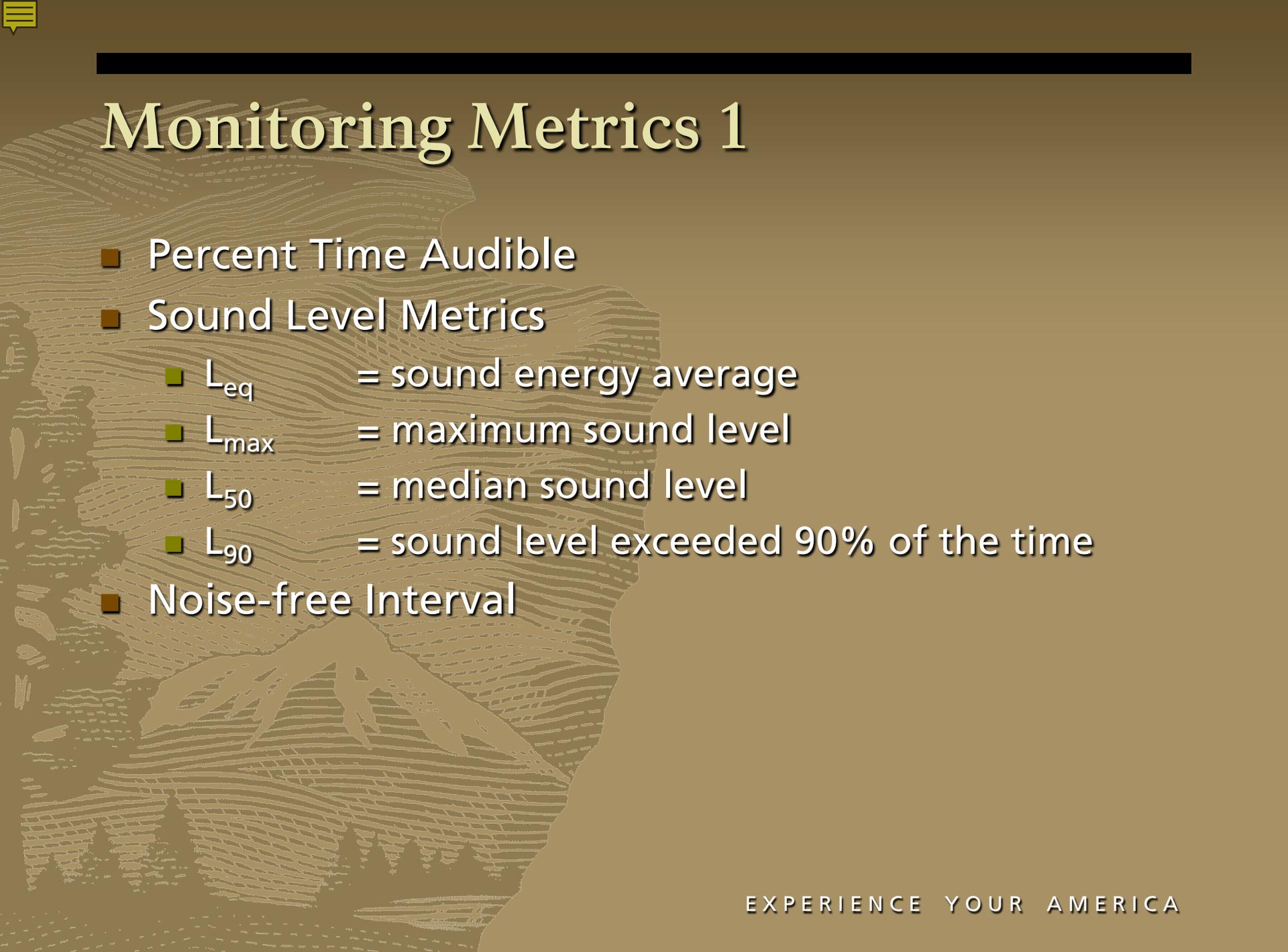




# Monitoring Strategy 1

## Predictions under Winter Use Plan

- *Per WU Plan, allow only BAT snowmobiles and snowcoaches*
- *Per WU Plan, allow only prescribed number and type of Transportation Events*
- Monitor travel patterns to assure they remain true to WUP assumptions
- Monitor compliance with speed limits
- **Continue sound monitoring at long-term sites throughout transition period and beyond**



# Monitoring Metrics 1

- Percent Time Audible
- Sound Level Metrics
  - $L_{eq}$  = sound energy average
  - $L_{max}$  = maximum sound level
  - $L_{50}$  = median sound level
  - $L_{90}$  = sound level exceeded 90% of the time
- Noise-free Interval



# Monitoring Strategy 2

## Comparability of Impacts

- Monitor snowcoach and groups of snowmobiles noise impacts at near-road visitor destinations

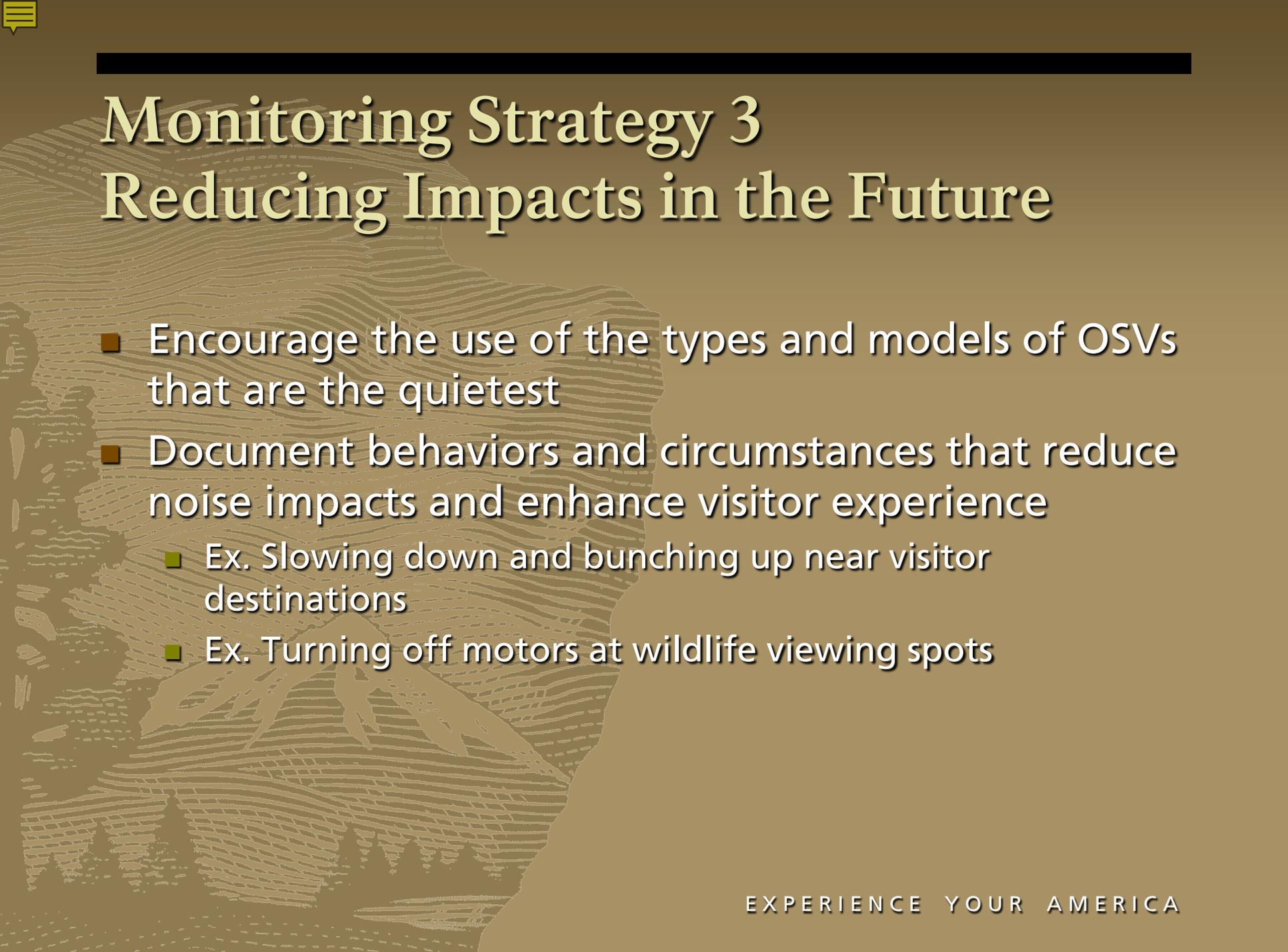
# Monitoring Metrics 2

- **Time Above Metrics**

- 10 dBA above natural ambient (masking of natural sounds)
- 55 dBA (speech interference)

- **Maximum Sound Level**

- **Percent Time Audible** (presence of OSV noise can impact visitor experience)



# Monitoring Strategy 3

## Reducing Impacts in the Future

- Encourage the use of the types and models of OSVs that are the quietest
- Document behaviors and circumstances that reduce noise impacts and enhance visitor experience
  - Ex. Slowing down and bunching up near visitor destinations
  - Ex. Turning off motors at wildlife viewing spots

# Monitoring Metrics 3

- Snowmobile Manufacturer Noise Certification Results
- Snowcoach Noise Certification Results (park pass-by testing)
- Sound Monitoring Results (same metrics as described earlier)
- Anecdotal Observations