Smoke Communication Strategy

PURPOSE – To provide Yosemite National Park with a blueprint for how to manage future smoke events from prescribed fires, fire use projects, suppression actions, and fires occurring outside the park.

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Part One
Case Study - Hoover Complex

The recommendations contained in this *Smoke Communication Strategy* are based on the experiences from the Hoover Complex of 2001.

BASIC INCIDENT FACTS

- The Hoover Fire began with a lightning strike on July 4, 2001. As of September 4, 2001, the fire is 7,883 acres. Four small fires (Cold Creek, Kuna, Lyell, and Clark) are part of the larger Hoover Complex and total an additional 100 acres (approximately).
- At the same time as the Hoover Complex, other large fires were burning in the region near Coulterville and Oakhurst which contributed to the smoke problem.
- The presence of smoke in Yosemite Valley, El Portal, and Tuolumne Meadows for 14+ days became a major concern during this incident, especially for park employees and residents.
- Since fires in the Illilouette drainage are particularly troublesome for smoke in Yosemite Valley, the Interagency Fire Use Management Team implemented a plan which included the construction of fire line on the northwest section of the fire to prevent spread into that drainage.

COMMENTS AND QUESTIONS DURING HOOVER COMPLEX

During the Hoover Complex, the park and the Incident Management Team received numerous comments and questions from employees and the public about smoke. In general, the comments and questions can be categorized into six groups: 1) immediate and long-term health concerns, 2) the need for tips to reduce exposure, 3) work schedule/administrative issues for employees, 4) the desire for park management to show concern, 5) impacts on recreational activities, and 6) visibility. (See Appendix A for specific text from letters and emails)

LESSONS LEARNED FROM HOOVER COMPLEX

1. The park needs to anticipate smoke events and distribute information before conditions deteriorate.
2. Involvement from park managers is crucial to communicating smoke messages.
3. Park supervisors need clear instructions about how to accommodate employees who are affected by smoke (alternative work schedules and locations, etc.).
4. Park employees, unlike visitors, worry about the effects of long term exposure to smoke since they are not a transient population.
5. Monitoring of air quality, particularly PM, is imperative and needs to begin early in the fire incident.
6. Smoke management is complicated when there is more than one large fire in the area.

7. While it is impossible to immediately extinguish a wildland fire when smoke exposure becomes a health risk, it is helpful for people to know that there are fire management techniques available that can reduce smoke in these situations (i.e. water drops, fire line construction).
8. It is reassuring for people to know that park management cares about their welfare.
9. Neighboring communities must be included when distributing smoke information.
10. Most people understand and support the general concept of fire use; actions to promote understanding are still necessary during smoke events.

Part Two
Future Strategy

The key to a successful strategy is targeting the right people (audiences) in the right ways (methods) with the right messages (talking points). During a fire incident, there are specific smoke messages that can be integrated into the general fire information effort.

AUDIENCES

1. Superintendent, Assistant, and Deputy
2. Division Chiefs
3. All employees and their families
4. Safety Committee Members
5. Concessionaires and their employees
6. Park Visitors
7. Media
8. Park Communities – Yosemite Valley, El Portal, Foresta, Wawona, Hodgdon, White Wolf, and Tuolumne Meadows.
9. Neighboring Communities (including eastside) – Yosemite West, Fish Camp, Oakhurst, Mariposa, Midpines, Coulterville, Groveland, Sonora, Lee Vining, June Lake, Mammoth Lakes.
10. County Health Departments and Air Districts for Mariposa, Tuolumne, Madera, and Mono

METHODS

During a Fire Incident

1. Clearly outline the authority given to park supervisors to minimize smoke impacts to their employees. Employees can notify supervisors if they are having adverse impacts from smoke. Alternative work schedules and locations will be arranged where appropriate.
2. Hold Open House/Town Meeting for employees and residents in smoke affected areas.
3. Operate particulate monitors in affected areas. Be prepared to move or add monitors. Start monitoring early in the incident.
4. Provide daily air quality information, which interprets the particulate monitor data.
5. Set up a smoke hotline (phone) to handle smoke complaints.
6. Leave flyers on employee doorsteps with tips to decrease exposure.
7. Post on bulletin boards.
8. Put information in the “Daily” (hard copies and email)
9. Use the park webpage as a vehicle for dispersing daily air quality information.
10. Give air quality conditions during the daily weather report on park radio.

Year-round Actions

1. Incorporate air quality messages into year-round public outreach: interpretive programs, public meetings, press releases, etc.
2. Offer special air quality seminars or trainings to help locals understand regional air issues.

SMOKE TALKING POINTS

In addition to general fire messages/information, the following talking points on smoke should be included in public information. Each talking point includes an example of language that might be used in updates, press releases, articles, presentations, etc. The talking points are organized in groups according to trigger points (i.e. specific time periods in an incident): Year-round, Early Fire Season, Beginning of Incident, Air Quality Index (AQI) exceeds 50 for PM10, and AQI exceeds 100 for PM10.

Year-round

1. Wildland fire smoke fits into a larger regional air quality situation.

Example: "The scenic vistas in the parks, especially in the summer, are highly obscured by regional haze. Haze is caused when sunlight encounters tiny particles in the air. These particles may be the result of either natural events or human activities. According to the local Air District, over 95% of the particulate pollution in our area originates from Central Valley sources (i.e. motor vehicles, industrial fuel burning, manufacturing, and agriculture). Less than 5% comes from wildland fire in the Sierra Nevada." (From SEKI's *"Story of Fire"* newspaper)

2. Smoke, like fire, is a natural ecosystem component.

Example: "A Breath of Fresh Air: Is there a bright side to all this talk about smoke? While it is a health concern for humans, plants have adapted to live with smoke just as they have many other natural elements of the environment. Scientists are discovering that some plants might even depend on smoke for their survival. A recent study looked specifically at the low elevation chapparral plant communities. In the laboratory, scientists exposed various seeds to heat and charring, as in a fire, and certain species remained dormant. When the same seeds were exposed to smoke, germination occurred. While some plants, like the giant sequoia, use heat from fires for seed dispersal, it now appears that other plants rely on smoke for germination." (From SEKI's *"Story of Fire"* newspaper)

Example: "Research has shown that smoke reduces the growth of mistletoe, which can damage black oaks."

Early Fire Season

Use general fire messages and:

3. Park managers are sensitive to smoke impacts for visitors and employees.

Example: "The Yosemite fire program is committed to balancing the needs of park resources and people. While fire has always been a natural part of this ecosystem, our current society presents unique conditions. Today, there are more people than ever living in or visiting Yosemite National Park. Every fire management action considers this fact when determining incident objectives."

Beginning of Incident

Use the talking points above and:

4. **The park has the ability to monitor particulate levels in Yosemite National Park during smoke events.**

   Example: "As soon as the park anticipates a smoke event with the ability to affect people, air quality technicians begin operating a Smoke and Weather Monitoring Module. This mobile unit measures particulate levels in the air. Particulates are solid particles produced by things like vehicle emissions, agricultural activities, and fires. The module records levels every hour and then computes a 24-hour average which correlates to the National Ambient Air Quality Standards (NAAQS) established by the Environmental Protection Agency (EPA). During extreme smoke conditions, technicians retrieve data from the module daily."

5. **Some characteristics of smoke accumulation are predictable because they are based on daytime and nighttime winds.**

   Example: "Up-slope or up-canyon breezes occur during the day which will often take smoke into higher elevations. At night, these winds change direction and bring smoke down-slope to the lower elevations."

6. **Some characteristics of smoke accumulation are not predictable since they are dependent on atmospheric conditions.**

   Example: "With unstable atmospheric conditions, smoke from wildland fires is mostly lofted up to very high elevations where it disperses. When atmospheric conditions are stable, perhaps with an inversion layer, smoke can be trapped at lower elevations.

For prescribed fires include:

7. **Due to the deliberate nature of prescribed fire, audiences can be notified prior to the smoke event about what to expect.**

   Example: "During the week of ignition, visitors traveling through the area will smell and possibly see smoke. Smoke will likely be visible from [specific location]. The smoke will most likely settle in lower elevations during the early morning."

8. **During prescribed burns, fire managers utilize smoke management techniques.**

   Example: "The entire burn segment is 925 acres, but is split into two sections for smoke management reasons. A fire line has been constructed inside the segment where the fire can

be held if smoke production is a problem. The burn boss plans to ignite 30-40 acres per day to minimize smoke output. This will increase the duration of the smoke event but will decrease the ambient level of smoke at any one time."

For Fire Use include:

9. Small natural fires have the potential to become large fires.

Example: "Burning in heavy mixed conifer fuels, the newly discovered [*Name*] Fire has the potential to expand across hundreds of acres over the next several months. This fire was naturally-caused and will be naturally-extinguished with rain or snow. A "season-ending event" bringing more than ½-inch of rain over a 3-day period usually occurs in October."

10. There are ways of minimizing smoke output in a fire use project without suppressing the fire.

Example: "While the park hopes to maximize resource benefits by allowing this fire to spread naturally, managers have at least two ways of reducing smoke in special situations. Hand crews can install fire line in strategic locations to contain certain areas of the fire. For example, keeping fire out of the lower Illilouette drainage would reduce smoke in Yosemite Valley. In extreme smoke situations, fire managers can drop water on hotspots. Unlike water drops in suppression actions, these drops are not meant to halt fire movement, but slow it down and reduce smoke."

When AQI Exceeds 50 for PM10

Use the talking points above and:

11. There are ways for park residents and neighbors to reduce their exposure to smoke.

Example: "Smoke concentrations can be avoided by planning morning activities away from Yosemite Valley and afternoon activities away from higher elevation areas, such as Tuolomne Meadows. Close windows, doors, and outside vents when it is smoky to prevent accumulations indoors. Run your air conditioner, if you have one. Keep the fresh air intake closed and keep the filter clean. Ventilate your home and work place during periods of little smoke. Avoid physical activities while smoke is dense. Paper masks are designed to trap large dust particles, not the tiny particles found in smoke. These masks generally will not protect your lungs from wildland fire smoke."

Example: "Residents of communities affected by smoke from wildland fires and prescribed fires are encouraged to practice the recommended health habits. A healthy immune system is the best protection against the effects of smoke. Immune function is enhanced with regular moderate physical activity, good nutrition, hydration, and adequate rest." (From USDA Forest Service publication *Health Hazards of Smoke: Spring 2001*)

12. Breathing smoke is not healthy for anyone, but some people are at greater risk.

Example: "People with heart or lung disease, such as congestive heart disease, chronic obstructive pulmonary disease, emphysema or asthma are at greater risk. Children and the elderly are also more susceptible to smoke. These people are advised to use caution and avoid physical activity while heavy smoke is present."

Example: "The risks of occasional exposure to fine particulate and other components of vegetative smoke are minimal for healthy individuals. However, elevated levels of smoke that persist for months or years increase the risk of heart and respiratory disease, especially among the elderly and individuals with pre-existing respiratory or cardiovascular illness." (From USDA Forest Service publication *Health Hazards of Smoke: Spring 2001*)

13. The *Air Quality Index* (AQI) is one tool that helps the park, visitors, and employees quantify daily air quality conditions.

Example: "Established by the Environmental Protection Agency and adopted by the States, the Air Quality Index (AQI) is a tool for reporting daily air quality conditions. Using numeric information from sensors like particulate monitors, the AQI tells you how clean or polluted your air is, and what associated health concerns you should be aware of. The AQI focuses on health effects that can happen within a few hours or days after breathing polluted air. You can think of the AQI as a yardstick that runs from 0 to 500. The higher the AQI value, the greater the level of air pollution and the greater the health danger. The Index identifies six conditions: good (0 to 50), moderate (51 to 100), unhealthy for sensitive groups (101 to 150), unhealthy (151 to 200), very unhealthy (201 to 300), and hazardous (over 300)."

AQI exceeds 100 for PM10

Use all of the talking points above and hold an open house/meeting to respond to community, public, and employee needs.

TALKING POINTS AT-A-GLANCE

The detailed talking points outlined earlier are indicated below with their corresponding numbers. When incorporating these messages into materials, refer back to the text examples.

Year-round	Early Fire Season	Beginning of Incident	AQI exceeds 50 for PM10	AQI exceeds 100 for PM10
1.Wildland fire smoke fits into a larger regional air quality situation.	3. Park managers are sensitive to smoke impacts for visitors and employees.	4. The park has the ability to monitor particulate levels in Yosemite National Park during smoke events.	11. There are ways for park residents and neighbors to reduce their exposure to smoke.	Use all of the talking points hold an open house/meeting to respond to community, public, and employee needs.
2. Smoke, like fire, is a natural ecosystem component.		5. Some characteristics of smoke accumulation are predictable because they are based on daytime and nighttime winds.	12. Breathing smoke is not healthy for anyone, but some people are at greater risk.	
		6. Some characteristics of smoke accumulation are not predictable since they are dependent on atmospheric conditions.	13. The *Air Quality Index* (AQI) is one tool that helps the park, visitors, and employees quantify daily air quality conditions.	
		PRESCRIBED FIRE 7. Due to the deliberate nature of prescribed fire, audiences can be notified prior to the smoke event about what to expect.		
		8. During prescribed burns, fire managers utilize smoke management techniques.		
		FIRE USE 9. Small natural fires have the potential to become large fires.		
		10. There are ways of minimizing smoke output in a fire use project without suppressing the fire.		

Appendix A

COMMENTS AND QUESTIONS DURING HOOVER COMPLEX

During the Hoover Fire Complex, the park and the Incident Management Team received numerous comments and questions from employees and the public.

Employees

1. Health Impacts - Symptoms include: headaches, sore throat, sinus stuffiness, head congestion, heavy or labored breathing, increased asthmatic complications, watery and or red eyes, blurry vision, tiredness, burning sensation, irritated eyes, and loss of appetite.
2. "Are there any additional health hazards from short-term exposure to the higher levels of particulate matter in the air during portions of the work day?"
3. "Can employees use the CA-1 to report smoke related problems?"
4. "Can employees work alternative work schedules?"
5. "If unable to work outside of the valley, or Tuolunme Meadows, what precautions can we take to minimize the continued impact of the smoke exposure?"
6. "Can employees go to the clinic during work hours?"
7. "Can air quality information be posted daily for employees?"
8. "Acknowledgement and concern for the situation from park leaders [would] certainly ease many of our minds."
9. "Fire is an important and necessary part of Yosemite and I support it whole heartedly, in fact we need more. The health of all employees and families here are also important and I would like very much to help, to learn how we can make this situation more user friendly or endurable for our park family."

Public

1. "The smoke from these fires has affected the Mammoth area and parts of Inyo National Forest. As a result, the air is polluted in these areas and has created respiratory and allergy problems for those of us that like to golf, fish, and hike."
2. "I know fire can be good for the forest at times…it can also cause many problems. I live in Mono County and have been enduring smoke, much of which is coming from your park. It has become difficult to breathe, our eyes are watering, and…many people are complaining of being sleepy all of the time due to the smoke. I would appreciate it if you would do the right thing by putting the fires out."
3. "The smoke over here on the east side is really bad. I have a small motel and people are leaving early. I notice that you are controlling one side of the fire so that the smoke in the valley doesn't get too bad. What about us over here? Is there any way to balance natural fire practices with some smoke suppression?"

Appendix B

OTHER SOURCES OF INFORMATION

1. Local Air District

2. Air Quality Specialist in the park

3. California Air Resources Board Public Education website – (many links)
   www.arb.ca.gov/smp/progdev/pubeduc/pubedue.htm

4. National Interagency Fire Center – www.nifc.gov

5. Environmental Protection Agency – www.epa.gov/airlinks/

Appendix C

EXAMPLES OF MATERIALS

The following materials are attached to this document. These materials were created during the Hoover Complex or were gathered from other parks. Since they predate this *Smoke Communication Strategy*, they serve only as examples and are not templates for this document.

1. *Do You Smell Smoke?* or *Where there's fire there's smoke* – General description of where smoke is coming from and some simple steps for reducing exposure.

2. *Smoke and Your Health* – Questions and answers about wildland fire smoke and health.

3. *Smoke Generated by Wildland Fires* –Describes PM-10, the Air Quality Index, and the use of particulate monitors. (example from SEKI)

4. *NPS Using Portable Module for Smoke/Weather Monitoring* –Describes the purpose and operation of mobile monitoring stations. (example from SEKI)

5. *Smoke: Up, up, and Away* – Example of an interpretive article for park newspaper on smoke management techniques used in a prescribed fire. (From SEKI's *"Story of Fire"* newspaper)

6. *Smoke Complaint Log* – Sample sheet for cataloging smoke complaints during a fire event. (example from SEKI)