Branding of an Ecosystem-Wide Bear Safety Message

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Executive Summary

In creating brand strategy, we aim to create and disseminate messages that are consistent and persistent in the audience's memory; in the case of bear safety branding in the Greater Yellowstone Ecosystem, we want to influence people's perceptions of the threat that human-bear interactions present. The messages throughout the ecosystem should *not* be identical – branding is most effective when it is context-specific and salient for the intended audience. Thus, various stakeholders in the GYE (federal and state agencies) can maintain autonomy regarding bear safety messaging in their jurisdictions, while promoting an effective (i.e., cohesive and persuasive) message for outdoors enthusiasts, regardless of whether they are hunters in their local forests, or international tourists visiting the National Parks.

Key findings

- Literally brand a life-size, 3-D paw print, along with the words, "Bear Habitat," on appropriate surfaces across the GYE – on picnic tables, bear boxes, trailheads, etc.
- State all information explicitly and concisely
- Provide data-driven warnings for visitors
  Examples:
    - Create infographics showing the locations of recent (within one year) bear activity. With competent graphic design principles, these maps would indicate just how ubiquitous bears are in the GYE without being simply a mass of dots overlying the geographic area included in the study.
    - Provide dates on signs that indicate high levels of recent bear activity in an area. The harsh environment of the GYE leads to quick weathering; warning signs without dates give no understanding of the recency of the threat.
- Only post "Bear Attack" and other danger-level signage in areas where actual bear encounters have been reported—do not use at locations like gift shops, gas stations, etc.
- Create different levels of signs according to threat level in order to slow habituation and attract attention
- In non-threatening locations use informational, proactive messaging instead of fear messaging
- Have trailhead signs posted with actionable behaviors that can be performed at that point.
- Utilize graphic design best practices when choosing specific symbols, wording, coloring, channel, and context for signs and posters
- Make sure all signage is durable and weather-resistant—faded, worn-out warnings make the messages less effective
- Encourage independent agencies and their employees to strive to be 100% consistent in delivering, modeling, and enforcing bear-safe behavior
- Design the environment and behavioral systems to make it easy for people to comply with regulations

Introduction

During the summer of 2011, two people were killed by grizzly bears in Yellowstone National Park (in separate attacks). These fatalities caused land managers across the Greater Yellowstone Ecosystem (GYE) – especially in the National Parks – to question the efficacy of their efforts to educate visitors about bear safety in a consistent and effective manner. They were particularly concerned about visitors who travel in the area over multiple federal management jurisdictions (e.g., moving from National Parks to National Forests to State Forests without any break in the continuity of the landscape).

Prior to the attacks, Grand Teton National Park (GRTE), in collaboration with the Wyoming Survey and Analysis Center (WYSAC), completed a research project in which sociologists evaluated the public education and information component of the park's "Be Bear Aware" program. Results suggested the program materials were "being seen, accessed, and understood by a majority of campers and picnickers visiting the park during the summer of 2010" (WYSAC 2011). However, there was evidence that important deficiencies exist in visitors' knowledge about what to do when encountering a bear and about general bear behavior (WYSAC 2011).

This research builds on this prior research and examines the design and deployment of the bear safety messages across the GYE. This phase of the project answers the following questions:

1. Is there too much variation in the bear safety messages posted by federal (and state) agencies, which results in diluting the message, confusing the message, and therefore rendering the message less effective?

2. Would land managers be more effective in disseminating bear safety messages if we were able to brand a clear and concise message and standardize signs and messaging across the landscape?

Given the data we collected and analyzed in the summer and fall of 2012, we assert that the answer to the first question is "no," and the answer to the second question is a qualified "yes." However, these questions, and answers, are not as simple as they may seem, and this report deals with the nuances inherent in these questions, with an emphasis on how the various agencies acting in the GYE can leverage strategic branding and communications processes to increase the efficacy of their bear safety messaging.

Branding is more than the creation of a logo and a slogan. Strategic branding seeks to fundamentally understand the characteristics of an audience, and figure out how brands can most effectively communicate with them. Furthermore, branding is not just about communicating facts – in fact, its primary purpose is to convey or provoke an emotional response from the audience.

For most people, having a close encounter with a bear is a frightening prospect. Both the bear and the person face dangerous consequences of getting too close to each other. However, bear habitat in the GYE is a very attractive recreation destination for people around the world. As such, appeals for bear-safe behaviors in the GYE have largely relied on a combination of fear appeals and informational appeals to simultaneously educate and warn visitors about human-bear interactions. Herein, we systematically address elements that affect the effectiveness of the bear-safety communication efforts in the GYE.

In creating brand strategy, we aim to create and disseminate messages that are consistent and persistent in the audience's memory; in this case, we want to influence people's perceptions of the threat that human-bear interactions present. Note that this does *not* mean that the messages have to be identical – in fact, branding is most effective when it is context-specific and salient for the intended audience. Thus, it is possible for various stakeholders in the GYE (federal and state agencies) to maintain autonomy regarding bear safety messaging in their jurisdictions, while promoting an effective (i.e., cohesive and persuasive) message for outdoors enthusiasts, regardless of whether they are hunters in their local forests, or international tourists visiting the National Parks.

A consistent ecosystem-wide safety message and logo – a "Be Bear Aware" brand is an excellent idea. We recommend using the paw print logo that is already in use in many places. This logo should go on bear boxes, garbage cans, bathroom doors, trailhead signs, websites, brochures and PDFs – basically, everywhere that wilderness users have a chance to access bear-safety information. Each context (e.g., the trailhead v. the campground v. the fishing access site), and/or each jurisdiction (federal v. state management) could have its own design that is eye-catching and appropriate for the level of warning and the activity.

Background

National Park managers and policymakers face several thorny issues regarding visitor education about grizzly bears. They must balance attracting visitors to the parks, and educating them about bear safety without scaring them off. They must deal with the entire spectrum of people's knowledge and attitudes regarding wild animals, motivation to protect the sanctity of the wilderness (within the apparent civilization and safety of the parks), wilderness skills, and English fluency and literacy.

The areas of the GYE that lie outside the National Parks (such as state and national forests) accommodate different user populations than the parks do. In addition to the hikers, campers, picnickers, and skiers who also enjoy the parks, public lands in the GYE also host climbing, hunting, fishing, and non-pedestrian use, such as by horses, and mountain and dirt bikes. In developed and semi-developed areas, user densities are much lower outside the parks than within them. Although there are public employees (such as game wardens) and other personnel (such as campground hosts) who enforce the regulations for these areas, these public lands are not monitored as closely as the developed and semi-developed areas inside the parks. Nevertheless, public agencies actively promote both recreation and safe practices in these wilderness areas (see, e.g., http://fwp.mt.gov/recreation and http://fwp.mt.gov/recreation/safety/wildlife).

The theory of approach-avoidance conflict (Lewin 1935) is especially helpful when considering this balancing act. This theory says that people often have to choose among options that carry both positive and negative outcomes. For land-use managers and concessionaires in the GYE, the conflict is, "How do we encourage people to choose to recreate here, but also to respect the real dangers that wildlife-human interactions present?" For visitors, it's, "How can I have a good time in this environment, and not have safety precautions take too much effort, and not get mauled or killed by a bear?" (We can even speculate that for bears, it's, "That food smells so good, but I don't want to be hazed or killed if I try to eat it.")

In general, warnings serve three primary functions:

1. To communicate important safety information to a target audience
2. To promote safe behavior and reduce unsafe behavior
3. To reduce or prevent personal injury (Wogalter et al. 1999)

As for bear safety messages in the GYE, wildlife managers have an additional motivation:

4. To prevent injury to, or habituation of bears.

A key message land-use managers need to enforce is that bears are *everywhere* in the GYE, even if visitors don't see them. As things stand now, people come to the area – and even seek first-hand information from others (e.g., Allphin 2012) – in order to see bears. Some people actively seek out contact with bears, or engage in activities meant to attract them (e.g. Ellis 2012). However, despite bears' mobility and the range of their habitat, the number of human-bear interactions is relatively small, which diminishes many people's perception that they need to take precautions to avoid or minimize interactions with them.

During a conversation with interpretive ranger Curtis Aiken at the Norris museum, he said, "Since the time it was founded, Yellowstone has always been thought of as a bear park. There's the famous photograph of Superintendent Horace Albright eating dinner surrounded by three bears. People love that picture because it's really cute, and they still think of the park that way." Another ranger at the West Yellowstone entrance to YNP told team members that visitors – especially those from cities and from outside the U.S. – have false sense of safety in the park because it is a park; they don't have the same sense of danger that they would have if they were in a less-managed wildlife area. Instead, they think that running into a bear wouldn't be as life threatening as the warnings and messaging make it seem. We confirmed that this perception is common among many visitors to the National Parks: In one instance, we overheard a camper in GRTE (approximately 70 years old) say, "I think all this bear danger stuff is just marketing to make the park seem more interesting. We've been here for 3 days, and haven't seen a single bear."

It is imperative to emphasize the fact that people's *perception* of the threat or danger that human-bear interactions pose to both humans and bears is the most important element in branding a safety message. If they don't perceive a threat to exist, they will likely behave in ways that endanger themselves and others, including bears. If they perceive the threat to be too great, they will likely forego enjoying the outdoors in the GYE. Humans are rational (to a point) in their response to health and safety warnings. However, the perception of risk outweighs actual risk when people are calculating the severity of threats they face. Therefore, the crux of this safety branding effort is to influence people's perceptions in such a way that they enjoy themselves while taking necessary precautions.

Methodology

First, we identified points of contact where outdoor visitors can encounter messages regarding bears in the GYE (which are not necessarily bear safety messages). We used the WYSAC report (2011) – specifically Table 8, Q19, and Appendices H and I – as the starting point for possible sources of visitor information.

Table 1 ***Sources of bear-related messages***

Time / place of contact	Information channels
Pre-planning stage	Websites (official and unofficial), blogs, books, magazines, news sources, travel guides, conversations
Planning/ pre-travel stage	All of the above, plus email, snail mail
During travel	Airports, rental car kiosks, lodging (lobby), signs/billboards
In town in the GYE	Shops, outfitters/guides, visitor centers
Park entrances	Conversations with rangers, park newspapers
Campground entrances	Conversations with concessionaires, kiosks, signs, posters
Campground facilities	Bathrooms, wash/dump stations, bear boxes, picnic tables, conversations with concessionaires and other campers
GYE facilities/ resources	Visitor centers/museums, parking areas, fishing access sites, trailheads, picnic tables, signs, posters, bear boxes, toilets, conversations with wardens/rangers.

Next, the members of the research team put ourselves in the position of people traveling from out of the area to visit the National Parks. In this phase of data collection, we looked at all the websites that naturally emerged while we were "planning" this hypothetical vacation. To capture a greater range of user experiences within the GYE, we repeated this exercise, putting ourselves in place of hunters preparing for deer/elk season. In both cases, we noted every time we encountered information related to bear safety, bear encounters, or bear regulations within the GYE. In addition to the expected sources of information (e.g., NPS and FWP websites, outfitters' websites), we discovered a considerable amount of bear-related messages on user-driven travel-planning websites such as TripAdvisor (http://tripadvisor.com), as well as on outdoor recreation sites that aren't bear- or location-specific (e.g. http://www.pirate4x4.com/forum/outdoor-sports-recreation). Since these types of websites provide a great deal of information to potential visitors to the area, we carefully noted what they said in order to create a fuller picture of the bear-message "landscape." However, we do not make recommendations in this report regarding their contents since they are not within the control of the agencies managing wilderness areas in the GYE.

Once we completed the preparatory phase of our data collection and had an understanding of what to look for regarding the communication and behavioral landscapes, our team traveled to the National Parks and camped in Colter Bay campground (GRTE) and Bridge Bay campground (YNP) for several nights each. While in the parks, we conducted a census survey of the facilities, systematically visiting all campgrounds and backcountry camping areas, picnic areas, trailheads, bathrooms, wash/garbage/dump stations, marinas, visitor and employee lodging areas, laundry facilities, dining areas, etc. In each location, we took photographs and field notes of the bear-related messages therein, and evidence of compliance and noncompliance with bear safety regulations by both visitors and employees. We also collected evidence (photos and field notes) of bear-related messages in other locations, such as visitors' centers, gift shops, and museums. In addition, we attended and recorded ranger talks at visitors' centers, amphitheaters, and museums. Finally, we interviewed park workers, both concessionaires and NPS employees. The conditions of the grant prohibited us from interviewing park visitors, but we did take field notes on visitors' behavior and conversations that we observed or overheard.

During and after the data collection period within the parks, we also surveyed the informational environment and collected data outside the parks. In West Yellowstone and Gardiner, Montana, and Jackson, Wyoming, we looked for (and recorded) bear-related messages at visitors' centers, gift shops, restaurants, and outdoor outfitters. Throughout August-October, we visited trailheads, campgrounds, picnic areas and fishing access sites in the Gallatin National Forest and surrounding area.

While we were collecting data, every member of the team reflected on the process throughout and at the end of the work day. Thus, collecting and analyzing data were iterative and recursive processes. Every morning during the intensive field data collection phase, the team would discuss the logistical and analytical plan for the day (what to look for, what to think about), based on the previous day's work. Every evening, we would discuss our findings and thoughts about what we had observed and experienced, and consider each other's insights in addition to our own. We shared all our data – photographs and field notes – as well as our ongoing analyses, on a private wiki designed for this project. As the information contained in this wiki grew, so did our mutual understanding of the communication landscape regarding bear safety in the GYE. Once the themes related to bear safety messages / branding emerged clearly, we looked to the literature for theory-based practices to guide our recommendations.

Findings and Strategic Recommendations

Characteristics of the user population

Before this report delves into specific recommendations, we must acknowledge the behavioral and motivational characteristics of people who choose to recreate in the GYE. The high variance among people's knowledge, concern, comprehension, awareness, and motivation means that the messages / branding efforts regarding bear safety are unlikely to be one-size-fits-all. As noted above, this is not, in itself, problematic, but it is something that land-use and wildlife managers must keep in mind when devising communication strategies to address their user populations.

Table 2 ***Characteristics of the user population***

Completely knowledgeable about bears, bear safety ------------>	No knowledge at all
Concerned about bears, bear safety ------------------------------->	Unconcerned
High comprehension ability -->	Low comprehension
Attentive to messages --->	Inattentive
Motivated to change behavior ------------------------------------->	Unmotivated

In the absence of closely encountering bears in the GYE (e.g., personally seeing them, hearing about encounters from other visitors), people have a hard time believing the seriousness of the threat – both to themselves and the bears. For example, all the members of the data collection team (5 people) are experienced front- and backcountry recreationists, yet before we began systematically collecting data for this project, none of us knew just how ubiquitous bears are in the GYE, even in the developed areas of the parks (e.g., in campgrounds). Yet in half a day while we were in the Colter Bay area of GRTE, an adult black bear wandered through the amphitheater, and a grizzly juvenile visited the group campsite early that morning.

Users' knowledge levels (or their perception of their own knowledge) can impact the effectiveness of safety messages by creating biases. For example, a bias to underestimate results in the belief that "I am the exception to the rule." In other words, we tend to believe that threat risks are lower for ourselves than for other people. Two user groups seem especially vulnerable to this bias: infrequent visitors to the GYE/outdoors, and active, avid outdoorspeople – in other words, people at the endpoints of the knowledge spectrum.

This bias can be addressed by making threat risks salient to these populations (i.e., highlighting their vulnerability). However, the effectiveness of fear-based appeals is also impacted by the amount of subjective knowledge that visitors have (or believe that they have). People who believe that they are knowledgeable about a threat risk – in this case, experienced

outdoorspeople – are more likely to ignore or discount fear appeals (Witte 1994) than people who accept their own ignorance regarding the threat.

We posit that outdoor users who are concerned about their own and others' well-being (including bears'), will be motivated to follow bear-safety recommendations. Despite the messaging that is already available to the public, not everyone sees a reason to be concerned; thus, there continue to be incidents of people actively using food or other bait to attract bears. We believe that people in this "unconcerned" segment of the population are the most difficult to convince to change. Messages that emphasize that 90% of habituated, or "nuisance" bears must be euthanized (http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/default.html), and that intentionally feeding bears is illegal throughout the GYE, seem like the likeliest way to promote behavioral changes in this population. Making these messages clear and compelling to this segment of the audience, however, is challenging.

This brings up the next user characteristic: comprehension. The recreational opportunities in the Rocky Mountains attract a high number of non-native English visitors every year. Furthermore, the complexity of much of the signage related to bear safety – lots of small type in long paragraphs on weathered signs – makes reading comprehension difficult, even for locals. This problem was clearly illustrated in 2012, when a Chinese tourist in Banff National Park (Canada) actively used bait to coax bears toward a tour bus (Ellis 2012). Parks Canada was unable to identify and interview the person, but warned the bus driver about the gravity of the offense. Another user group whose comprehension levels should be considered is children, who accompany approximately 61% of visitors to the National Parks (WYSAC 2011). By creating bear-safety messages that can be understood by the largest possible number of viewers, i.e., by using graphic design best practices (Hogben 1949), managers can minimize lack of comprehension as a limiting factor in people's adopting bear-safe practices, regardless of their language/reading skills.

Getting people's attention is the first step in motivating them to adopt bear-safe behaviors, and it may be the trickiest part of the process (Wogalter et al. 1999). The frequency of the same bear messages appearing in the GYE can lead to these messages becoming "noise" if they are not used strategically. For example, the new "Bear Attack" signs in GRTE and YNP are well designed and quite arresting. If posted in places where bear attacks have occurred, they are likely to be effective in alerting visitors to the dangers inherent in the GYE. However, when warnings such as these appear at gas stations, gift shops, and other non-contextual locations, their impact is greatly diluted. The proliferation of these types of messages, coupled with the rarity of reported human-bear encounters, can contribute to visitors' feeling that the bear threat is overstated, and lead them to ignore information that might be extremely useful in other contexts. Managers must place bear safety messages strategically – where they are both relevant and salient to their intended audience – and ensure that they attract as much attention as necessary.

Design elements should be varied, depending on location, and placement must allow visitors to process the message easily (from a moving car, at a trailhead, etc.).

Finally, motivation. When bear-safe actions are difficult, time consuming, expensive, or take a high level of expertise, only highly motivated people will engage in these behaviors. Interestingly, environmental design in the form of choice architecture (Thaler and Sunstein 2009) can elicit bear-safe practices even in people with low levels of motivation to do so. Low-motivation users frequently and easily respond to physical cues, without realizing that they are "doing the right thing." Managers who prioritize ease of use when designing facilities for recreating in the GYE (such as wash/dump/garbage stations, bear boxes, etc.) will find that compliance with bear safe practices rises "automatically." Similarly, designing systems to encourage people to carry bear spray (say, through economic incentives such as rental programs) will increase compliance.

Framing also plays a large part in people's receptivity to bear safety messages and measures. According to interpretive ranger Curtis Aiken (at the Norris museum), the titles of the rangers' talks influence how many people listen to them. Mr. Aiken said that when they announce that they will be holding a "safety talk," people actually hurry away, in order to avoid being lectured to. The average attendance at these talks is 0-4 people. However, when rangers describe the identical content as a "wildlife talk," they will have up to 20 people gather around to listen and ask questions.

Using fear appeals – proceed with caution

When faced with a threat, people assess:
1. the severity of the threat
2. the probability of its occurrence
3. their belief in the efficacy of the recommended action(s)
4. their confidence in their ability to perform said action(s)

(Rogers 1975, 1983; Witte & Allen 2000).

Managers must anticipate how visitors will react to fear-based appeals in bear safety messages. In a threatening situation, a person's fear, perceived threat, and perceived efficacy are reciprocal with each other; the greater the perceived threat, the greater the person's fear response will be, which can override his/her thinking (Witte & Allen 2000).

Effective fear appeals use mild fear and anxiety in order to motivate action. Ineffective fear appeals create anxiety, but do not demonstrate if or how this anxiety can be alleviated. Therefore, in designing fear appeals to convey bear safety messages in the GYE, managers need to make

sure to include information on how to avoid/mitigate bear encounters. When possible, messages should use pro-active information (as opposed to fear appeals) to convey bear safety information.

If they decide to use fear-based messages, managers must determine,
1. Will viewers be scared?
2. How will they perceive the potential threat?
   - "How likely is it that I will encounter a bear?"
   - "Just how bad would/can a bear encounter be?"
3. How will they perceive the efficacy of the suggested responses?
   - "Would I be able to face the bear/stand my ground/use bear spray if I encountered a bear?"
   - "Can I remember to do all these things?"
   - "Do these actions even work?"

If people's perceived efficacy exceeds the perceived threat, they will follow the behavioral guidelines indicated by the message. If perceived threat outweighs perceived efficacy, people will engage in denial, avoidance, source denigration – they will not comply with the bear safety suggestions. Ironically, strong fear appeals (really scary messages) often lead to noncompliant behaviors, because they create a perceived threat that cannot be alleviated.

There are two other caveats to using fear appeals. The first is that people often find them manipulative, and therefore discount them. The second is that people who are knowledgeable or believe they are knowledgeable about bears and bear safety are unlikely to believe them. Both of these situations can lead to noncompliant behavior.

Interactive installations – the keystone of the "Be Bear Aware" brand

Recreation in the GYE is what marketers consider an "experience product." In other words, the user's experience in the GYE creates the product – the person, the location, and the activity are inseparable in the consumer's mind. In order to be effective, brand messages for experience products must emphasize both the tangible and intangible aspects of experiential consumption environments. The design of the location – even subtle elements, as are found in the GYE – are key to ensuring people's satisfaction with their experiences there (Moorthi 2002), and interactivity (i.e., haptic learning) is an excellent way to gain people's attention and encourage them to understand messages that location managers wish to convey (Peck and Wiggins 2006).

We suggest a life-size, durable, permanent 3-D bear paw print, along with the words, "This is Bear Habitat," installed – literally branded – in key locations throughout the GYE, such as on picnic tables. These brands should supplement and/or replace current signage. Kerry Gunther suggested using a branding iron to sear this image into tabletops; we agree that this is an excellent idea, since a literal brand would be durable, cost- and labor-effective, reusable, and

work across a variety of table media (wood, Trex, etc.). It would also resonate with people by reflecting the ranching history that permeates most of the GYE. These branded installations would be hard to vandalize, resistant to weathering, won't fall off tables and turn into litter, and their appearance will actually improve with time and exposure. In other words, they would be "as tough as bears," in contrast to the current warnings, such as notices stapled to picnic tables.

As part of a comprehensive bear-safety branding effort, we recommend that the 3-D life-size paw design should appear on bear boxes, at trailheads, and in other key locations (branded, painted, or in another durable medium) throughout the GYE. These brands will serve several important functions:

1. They will be interactive, generating higher levels of interest, attention, and learning than posters/signs do.
2. They will be educational/instructive, emphasizing the salience of the bear threat (i.e., the size and ubiquity of bears) without relying on explicit fear appeals.
3. They will effectively communicate the message to a wide range of visitors, presenting few to no barriers based on age, English-language proficiency, wilderness experience, etc.
4. They will help campers/picnickers understand the importance of storing their "smelly" items, and encourage them to use the boxes.
5. They will reinforce the comprehensive logo already in use in the parks (the paw print) throughout the GYE, strengthening the "Bear Aware" brand that already exists.
6. Their solidity will help visitors feel that everyone in the GYE takes the bear threat seriously. (In contrast, paper and plastic signs in poor condition make it seem like warnings are merely following bureaucratic mandate.)

Poster and sign design

Encouraging users to pay attention to signs and posters – which are vital components in communicating a comprehensive bear safety message in the GYE – is difficult, but can be improved by following standard best practices in design and implementation.

For signs and posters

a. For warning to be effective, it must first grab attention
b. Attention must then be maintained long enough for the receiver to extract the necessary information
c. Receiver must understand the warning
d. Message must be persuasive enough to evoke attitude change
e. Message must motivate the receiver to perform desired behavior

Repeated and long-term exposure to a single warning is likely to result in a loss of attention by members of the intended audience (Wogalter et al. 1999). Therefore, when considering an ecosystem-wide branding effort, we encourage individual jurisdictions to explore their own sign designs within a comprehensive messaging strategy. Research shows that altering a warning's appearance by periodically changing its format or content helps slow people's habituation to the warning. In other words, they will actually pay *more* attention to signs that differ from one site to another (national park v. state forest).

Within a single jurisdiction, variation is also helpful to slow people down and read the signs (instead of walking past, thinking, "I've already seen this all over the place"). Everyone on our data collection team observed visitors in the National Parks glancing at warning signs without reading them, or failing to notice the presence of the signs at all – even the most current "Bear Attack" signs that are posted in conspicuous locations where there had been recent bear activity (e.g., Willow Flats in GRTE). There is only so much a manager can do to attract attention to the message, but we suggest that consciously varying the design of the signs in the GYE – while maintaining a consistent bear safety message and accepted design principles – will have a positive effect on visitors' awareness of bear safety warnings. Another element in sign design that helps attract attention is making sure that that the size of the sign, and the size of the lettering, is adequate for the location and context (see e.g., http://www.grainger.com/Grainger/static/safety-sign-marking-requirements-201.html).

General design principles for warning signs suggest the following:
1. Avoid large amounts of text, or too much information on a single sign
2. Use large print and boldface type
3. Format with plenty of white space
4. Use coherent information groupings
5. Use bullets
6. Full justification may look pleasing but is actually more difficult to read than "ragged right"
7. Use well designed pictorial symbols (Wogalter et al. 1999)

Placement is very important in attracting people's attention to warning signs. Our team noticed that bear safety messages in the GYE were often included among other information at trailheads and campsites, reducing the probability that readers would notice and read them. In other locations, such as picnic areas, warnings are occasionally placed where they are convenient for the person placing the sign (also likely a function of not wanting to disturb the aesthetic quality of the location), but do not adequately convey the information they are designed to. Signs should not be placed on movable objects or adjacent to movable objects (doors, windows, etc.) that could potentially obscure the view of the sign.

At various locations we visited in the GYE, bear safety signs were obscured, hard to read (due to design elements and/or location), or outcompeted by other information in the immediate area. In contrast, other warnings, e.g., “slippery floor” signs in bathrooms, attracted immediate attention, thanks to their location (in the walkway), their construction (a 3-D warning pylon), and their rarity (only used when the danger was immediate). We recommend that bear safety warnings follow similar principles when possible (although we acknowledge the difficulty in this, as bear threats are unpredictable yet constant and ubiquitous in the GYE).

Because of the constancy of bear threats, which make permanent and quasi-permanent signs necessary, the key design elements – signal words and colors on signs and posters – should attract attention and give the audience an idea of the level of hazard present in the context of the sign. In descending order from greatest to least hazard, signals are:

1. “Danger”/ red – highest level of threat – indicates immediate danger
2. “Warning”/ orange – intermediate level – indicates a potentially hazardous situation which could result in serious injury or death
3. “Caution”/ yellow –indicates a hazard that could result in minor to moderate injury
4. “Notice”/ blue – indicates information/policy that directly relates to safety (http://www.grainger.com/Grainger/static/safety-sign-marking-requirements-201.html)

As such, red “danger” signs should be used sparingly in the GYE, in order to preserve their effectiveness at alerting people to bear-safety hazards that are imminent (e.g., a high probability of gut piles or bear activity in an area during hunting season, bear study area where animals are being tagged). Other signal colors should be used as appropriate to indicate the seriousness of the bear threat, as well as bear safety policies (such as in campgrounds).

Bear safety information that appears in printed literature should use different colored ink from the rest of the publication, if possible, and should be surrounded by ample white space, if possible, to call attention to itself. Right now, this information tends to get “lost” or deemphasized in the current designs.

Whenever possible, message designers should include and emphasize pictorial symbols depicting the hazard, consequences, or appropriate or inappropriate behavior, in order to increase all users’ comprehension of the warning. Symbols help viewers quickly recognize hazards, especially when they are depicted in appropriate color schemes. They also require limited literacy or English-language competency to be understood. Research indicates people pay more attention to warnings that have pictorial symbols than those that do not (Wogalter et al. 1999).

If necessary, in addition to the signal word and symbolic message, managers should briefly describe the nature of the hazard and describe the possible consequences associated with non-compliance. This information should be as clear and concise as possible. Finally, the sign

should provide information on how to avoid the hazard (eg. carry bear spray, stay in groups of 3 or more).

The new "Bear Attack" signs in the National Parks follow these guidelines extremely well, employing appropriate language, colors, and symbols (the line drawing of the bear), in order to convey the message that there is immediate danger to humans, due to bear activity in a given area. As stated above, these signs should be highly effective if they are used sparingly, and only in appropriate contexts (i.e., where bear attacks are likely to occur). We observed overuse of these signs, in non-salient locations (at gas stations and visitors centers).

To improve the clarity and seriousness of bear safety messages, we recommend discontinuing use of the term "bear country." Advertisers use "________ country" so frequently, and in so many contexts (e.g., "Florida is Romney Country," "Welcome to Marlboro Country") that the term conveys quasi-mythological qualities, rather than a real geographic designation. In other words, marketing messages that use "_______ country" dilute the effectiveness of warnings containing the term "bear country." Managers should adopt the term "Bear Habitat" instead.

Grand Teton National Park is located in **bear habitat**. All campgrounds, picnic areas, and recreation sites are home to bears. Store all food.

In addition to warning signs, wildlife managers should post informational signs in key locations throughout the GYE. For example:

Bears are:

- Smart (at least as smart as dogs)
- Great at remembering food sources
- Shy, but curious
- Always hungry
- Alert to smells
- Creatures of habit
- Vulnerable to human encroachment

(Note: items on this list have not been verified. Managers should determine which information is most relevant, given the location / context of the signs.)

Even for people who are native English speakers, many messages that currently exist are overwhelming – too much information, font too small, etc. In contexts where people's attention/comprehension is constrained, messages should be simple and straightforward. Comprehensive information regarding bears, bear safety, habitat, etc. is important and should be provided, but in the proper time and place (e.g., in brochures, on websites).

The types of messages we suggest be used most of the time in the recreational areas of the GYE should be short, clear and concise:

"Water bottles. Backpacks. Saline solution: ALL smell like food to bears."

or

"You might not see them, but in these woods, bears are EVERYWHERE."

In spite of reading and understanding warning signs, threat assessment components are not evenly weighted in each audience member's threat calculus. The salience of each of these variables depends on context (timing, location, etc.) and individual personality traits (knowledge, biases, etc.) (Block & Keller 1998). One answer to the question – how can we make the bear threat in the GYE salient to a greater number of people? – is to provide graphic, data-driven warnings to visitors, rather than relying on fear-based appeals. For example,

- Post infographics that show the locations of recent (within one year) bear activity in the area. If well designed[*], these maps could indicate at a glance just how ubiquitous bears are in the GYE without being simply a mass of dots overlying the geographic area included in the study. Furthermore, when appropriate, these images can be included in other informational materials, such as publications and websites. If time and money allow, the electronic versions of these maps could be made interactive and linkable with QR (quick response) codes published where appropriate in the GYE, such as in guidebooks, at outfitters' shops, at trailheads.
- Provide dates on signs that indicate high levels of recent bear activity in an area. The harsh environment of the GYE leads to quick weathering of information located outdoors; as such, warning signs without dates provide readers with little to no understanding of the recency of the threat.

Signs for people in cars must be designed to be readable and comprehensible. The speed limit at the location of the sign, the size of the sign, the size of the lettering, the color scheme, the graphics, and the amount of text are all critical design elements (see ANSI Z535-2002 for guidelines). For example, at the Colter Bay campground, a very informative animal awareness sign located just past the check-in kiosk was passed without slowing by every car I observed –

[*] Because this information is tricky to convey (the "mass of dots" image was suggested by Kerry Gunther), please employ the talents of a skilled graphic designer, rather than the do-it-yourself software that's available on the Internet, when implementing this strategy.

campers were done with business and free to get on with camping. Even if they slowed down, it's doubtful they could read the fine print on the sign. This information could be re-designed and placed on one or more signs in front of the kiosk. There is often a line of cars waiting, so campers are slowed/ stopped while approaching the kiosk, which would provide them with a perfect opportunity to look and learn. For people making their first entrance to the campground/GRTE, well-designed signs could heighten their anticipation about their stay in the park.

Once people have prepared themselves, traveled to their chosen location, and started hunting /hiking/ camping/ climbing/ etc. in the GYE, chances of dissuading them from their chosen course of action decrease substantially. At that point, they are likely committed to their activity, but they can be persuaded to prepare for an encounter with a bear. By creating signs emphasizing symbols and bullet points, and providing education on actions that can be taken from that point on, managers can help avoid or mitigate dangerous human-bear interactions. Consider, for example, the following progression of signs at a hiking trail:

At the gate: "Bear habitat: Carry bear spray"

At the trailhead: "Bear habitat: Stay with your group.
Hiking alone? Stay close to another group, if possible"

100 yards onto the trail: "Bear habitat: Make noise while you hike.
If you see a bear, do not run"

As with all the suggestions in this report, new signs should be evaluated for accuracy of content by an expert. In addition, the language, design, general location, and specific placement should be pre-tested (in the field, with actual visitors, if possible) for clarity, attention-grabbing quality, and overall effectiveness.

Other sources of bear safety messages – creating a bear safety culture

In addition to their explicit bear-safety communication efforts, land-use and wildlife managers in the GYE should work to ensure that all the messaging within their jurisdiction be part of a clear and concise bear safety brand. The success of the brand will rely, in part, on creating a culture in which behavioral norms promote bear safety. Norms and social influence play a big part in educating newcomers on acceptable, expected behaviors. Less experienced people observe more experienced people engaging in bear-related activities; awareness breeds awareness, and non-compliance leads to non-compliance. Lax enforcement of the rules, weathered signs, and other apparent nonchalance on the part of officials and quasi-officials (e.g., campground hosts) reinforce nonchalant/ non-compliant visitor attitudes, and makes them harder to change.

Some vendors recognize that they function in a normative capacity, even though they are not charged with doing so. For example, Bill Zager at the Yellowstone Association Institute (YAI) said in an interview, "We feel that in our position, we *always* have to set a perfect example [re bear-safe practices]. We can never start down the slippery slope." He elaborated that in his organization's branded van and clothing, YAI's employees and students are "magnets" for attention from other visitors to Yellowstone. As such, everyone associated with the group receives education and training in wildlife safety and ethics. In addition, the policies regarding food storage on the YAI campus are among the most stringent we found in our survey. The YAI does not allow food, toiletries, coolers, etc. in any of the cabins at the facility, despite the fact that the cabins are completely hard-sided buildings. All potential bear attractants are stored either in the kitchen in the central building, or in people's cars.

For the most part, concessionaires in lodging areas within the National Parks do an outstanding job in promoting and enforcing bear safety messages.

- At the American Alpine Club Climber's Ranch in GRTE, hosts give a detailed bear safety talk to every camper at check-in. All cooking must be done in a communal outdoor kitchen, and all food stored in bear boxes. Other items can be stored in Rubbermaid bins in the hard-sided cabins, if campers wish.
- Our team received similarly detailed information – unprompted – by the hosts in all the campgrounds in both parks. At Bridge Bay campground check-in, all new arrivals receive a bear/food talk (that is somewhat abbreviated for people who live in GYE).
- Employees at Colter Bay campground in GRTE described their policy for dealing with food, etc. that they confiscate from out-of-compliance campsites. Campers have to bring their citations to the kiosk and listen to a safety talk in order to retrieve their items from the "food jail."
- Exum Mountain Guides provides education, training, and food storage facilities for its employees and customers, and all its guides carry bear spray.

Having learned how strong the safety culture already is in most camping areas in the parks, we would like to point out that all lodging employees need to strive to be *100%* consistent in delivering, modeling, and enforcing bear-safe behaviors. The biggest offense our team observed was laxity in policing water bottle storage. If bears are attracted to water bottles, or can become habituated to them, they shouldn't be left out in violation of the current rules. The implication of current practices related to water bottles is that the rules are not based on realistic assessments of the threat they pose to humans or bears. This is a dangerous precedent to set when trying to change the public's perception of the validity of bear threats. Wilderness managers, and everyone who works in enforcement in the GYE, must not denigrate their own rules. There are ways to be friendly and educational while still enforcing the seriousness of the threat that even a water bottle can pose, both to people and to bears.

Other inconsistencies we observed: In a few locations, campground hosts put out fresh soaps on bathroom sinks as needed. Meanwhile, signs posted in those same bathrooms warn that bears are attracted to the smell of soap. Similarly, some bathroom garbage cans are not bear-proof, yet bathroom doors are frequently propped open for cleaning. In some lodging areas where employees were working, we observed garbage and/or cleaning supplies left unattended. Similarly, outside one restaurant, we noted coolers and kitchen mats left out, right next to bear-proof garbage and recycling bins. Although we noted these inconsistencies in employee areas, they were not closed to public view. We also noted that bear safety messages were almost nonexistent in areas of the parks with permanent lodging structures (e.g., Jenny Lake Lodge, Lake Yellowstone Hotel).

Within a small span of time or space within the GYE, messages regarding bears can vary widely, from frankly terrifying (images on some t-shirts, news reports from Soda Butte in 2010) to cute and cuddly (images on other t-shirts, commercial tourism websites, gift shop items). In fact, the merchandise sold within the GYE, including by concessionaires within the parks, as well as in gift shops in the region, contain the most mixed messages we observed. Officially, feeding bears is never tolerated, even if it is unintentional. Unofficially, visitors to the region are bombarded with images of bears eating. In almost every gift shop we visited in our survey, we saw bear spray and bears-eating-honey merchandise displayed within close proximity to one another. The bear-food connection depicted on tourist items is potentially troubling. The implication of many of these products and images is that bears' getting human food is benign/ cute; at worst, these images could suggest that bear-human interactions regarding food is actually desirable, even if visitors know that they are not allowed to intentionally encourage it.

As a proposed solution, we suggest asking gift shop owners in the GYE to make the bear safety message paramount in their retail design. (We recognize that these contractors/owners are independent of the governmental agencies within the GYE.) For instance, at the Lake Village gift shop in YNP, the sign describing the uses and benefits of bear spray faced away from the bear spray display. At the Jenny Lake gift shop, the bear spray was located on shelves above and behind the cash register (perhaps to mitigate theft, since the shop always seems to be crowded and the spray would be easy to steal).

Leveraging choice architecture – designing a bear safety environment

Another aspect of creating a comprehensive and effective bear safety brand across the GYE involves designing systems that encourage – invisibly, if possible – bear-safe behaviors. When people perceive the costs of complying with desired behaviors to be greater than the benefits, they are less likely to comply. Therefore, managers in the GYE should strive to reduce the costs of compliance by making desired behaviors easy to perform, or easier to perform than the

alternatives. By creating a physical and financial environment that promotes passive adoption of bear-safe behaviors, managers will reinforce the explicit messages and social norms that they work to actively promote across the ecosystem.

Some examples of this type of choice architecture (Thaler and Sunstein 2009) already exist. For example, the Climber's Ranch does not sell or rent bear spray, but lends it to guests for free. (These loaners are donated by people traveling by plane who have to leave them behind.) In many, but not all, campgrounds in the national parks and across the GYE, bear boxes make safe food storage easy. Along the same lines, the designers of the Colter Bay tent cabin area have made it easy for campers to properly scrape dirty dishes into appropriate bins, wash their dishes, and dispose of their greywater.

There are a number of changes that we recommend, based on our observations and discussions with personnel.

Permitting rangers at Colter Bay visitors center will provide boaters and backcountry campers with bear canisters if they don't have their own. The system for returning these canisters is very easy to use. However, the rangers told us that people don't usually ask them for bear safety information, although a lot of them do ask about bear activity in the area. Unlike at the campgrounds, backcountry permits don't require applicants to receive bear safety education, though rangers are happy to discuss it if people ask. We recommend that rangers create and promote a standardized educational component of bear education for people applying for permits.

Bear spray rental or loaner programs throughout the GYE would reduce the financial costs for people who do not need the product for more than a short time. The cost of a can of spray (up to $65) is not prohibitive as a stand-alone consideration, but in the threat calculus that people make (i.e., considering the extremely low probability that they will encounter a bear) the price of the spray seems very high.

One group of users for whom bear safety should be paramount is hunters, but for too many of them, a gun seems like enough protection against a bear attack. Systems that make bear safety the rule for hunters, rather than an afterthought, could certainly benefit this population. For example, the licensing system could be adapted, using features that already exist, to promote bear knowledge and bear safe practices. Montana requires that people applying for black bear hunting licenses to pass a bear identification test (http://fwp.mt.gov/education/hunter/bearID/default.html). The training portion of this website could be expanded to include bear safety information for all hunters, and required viewing for all first-time applicants for hunting licenses in the GYE. States might also consider rolling the wholesale cost of a can of bear spray into the cost of a hunting license, with appropriate opt-out provisions in place.

Bear boxes are excellent additions to the bear safety landscape, but are not used as much as they could be. Why don't more people use the bear boxes provided by wilderness managers?

1. They're hot – A brown metal box in full sun during a GYE summer day acts like an oven.
2. Invasion of privacy – In some campgrounds, bear boxes are designed to be shared by more than one party, but due to they way they're sited, they feel like they "belong" only to the occupants of one site. This is good design only if the boxes aren't meant to be shared.
3. Inconvenience – If they're too far away from the campsite/cooking area, people are less likely to use them, especially for "innocuous" bedtime items like contacts solution.
4. Fear of theft – sharing unsecured storage space with strangers is unsettling, especially for campers who are gone from the campground for long periods of time.

Although it is a very expensive solution, the best way we see to encourage people to use bear boxes is to provide more of them, ideally one per campsite. In many campgrounds in the GYE, there is only one box for ten or more campsites, and/or they are far away from most of the sites they are meant to serve. Boxes should be placed in the coolest possible part of the site, and situated in a way that allows campers to feel safe in leaving their belongings inside – set back from roads, doors facing away from public access areas. We noticed that people do not seem nervous about leaving items in their tents, and posit that well-sited bear boxes will prompt similar feelings of security.

In all campgrounds, dishwashing areas and garbage/dump stations should be designed to make bear-safe waste disposal as easy as possible for campers. The Colter Bay tent cabins are an excellent example of a well-designed washing facility. In other campgrounds in the survey area, we observed noncompliant camper behaviors, such as dumping greywater into toilets, and food waste and trash left in washing areas where garbage disposal options were inconvenient to use, or otherwise inadequate. While encouraging personal responsibility and Leave No Trace ethics, limiting garbage disposal options increases the probability that campers will not engage in bear safe garbage management practices.

At the West Yellowstone visitors' center, people are currently encouraged to sign into a digital "guestbook" at the building entrance. This digital guestbook could be programmed to include a one-question survey ("What are your plans in the park?") and then make quick bear safety recommendations based on the answer. For example, if a person selected "hiking" or "camping," the book could say, "Free wildlife safety training and bear spray demonstration at 3:30!" This center was quite busy every time our team members visited it; automating this basic function – helping shape a person's visit by guiding him/her to appropriate resources – would benefit both visitors and employees. Our team members had to take the initiative to find out when and where

it was being offered, but they found the bear safety class at West Yellowstone extremely interesting, helpful and informative. (It not only provides facts, but has all participants practice role-playing a situation where they come in contact with a bear.)

Summary

In this phase of the "Be Bear Aware" project, our team identified and assessed communications efforts in the GYE that are effective in helping create a strong bear safety brand, and those that can be improved. We used the suggestions and findings from the WYSAC report as the basis for our study, and drew on practical and theoretical knowledge from marketing and communications literature to inform our analysis and conclusions. Given the scope of the project, we determined that a qualitative research design was the best way to approach the research questions related to branding and messaging in the GYE. We hope that the findings and strategies we lay out in this report enable wildlife and land-use managers to communicate bear safety messages more efficiently and effectively to the widest possible audience of people who choose outdoor recreation in the GYE.

If this research continues, we recommend using a graphic designer to generate signs and posters containing messages that could be field tested for effectiveness. We would also suggest using observational and survey methods to test people's awareness and responses to the embossed paw brand. Testing of this kind would generate information about the branding effort as a unified campaign, in addition to the effectiveness of each individual element of the design.

We would also recommend a systematic review of the design and systems environments in the GYE, and to make desired bear safety behaviors the default outcomes in people's choices. Our team was primarily concerned with the explicit safety communication efforts made by managers in the GYE, and while we paid attention to the overall non-verbal messaging in the study area, we did not focus strongly on how these systems work, and how they could be improved. Therefore, we feel this area is ripe for further exploration. While changes of this nature could be expensive to implement in the short term, they could provide long-term, low maintenance efficiencies in creating a safer environment for bears and humans.

We have enjoyed this research very much, and appreciate the opportunity to learn more about the national treasures that these parks preserve. As we discovered in this process, people from around the world consider our backyard to be the finest playground in the world. We hope our recommendations help protect and preserve the safety of both people and bears in this ecosystem. We would be pleased to discuss these findings further with the National Park Service, the staffs of Yellowstone and Grand Teton National Parks, and/or the staffs of the state agencies within the GYE.

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