5. USING THE IMPLICATIONS WHEEL IN HORIZON SCANNING: EXPLORING IMPLICATIONS OF GROWING APATHY TOWARD THE ENVIRONMENT

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Abstract.—The Implications Wheel® is a structured brainstorming technique to explore possible consequences of any type of change. This paper describes an exploratory application of the Implications Wheel method to uncover potential consequences of important emerging issues identified through horizon scanning. The issue "growing apathy toward the environment" was explored. We found that even a quick, small-scale application of the method can identify many useful insights: 155 implications were generated, including many scored as highly significant.

INTRODUCTION

Over time, an ongoing horizon scanning process may produce hundreds or even thousands of "scanning hits"—indicators of emerging issues that could signal future change. Out of this large amount of data, the most important issues need to be identified, analyzed, and interpreted if they are to provide useful foresight (Könnölä et al. 2012). This paper describes an application of the Implications Wheel® method to explore potential consequences of high priority issues identified through horizon scanning. This method was applied to an issue that emerged from the USDA Forest Service-University of Houston Forest Futures Horizon Scanning project: the public's growing apathy toward the environment.

The Implications Wheel is a structured group process to explore possible consequences of any type of change (Barker 2011). An earlier version of this technique was proposed by Glenn (1972) and is called the Futures Wheel. Since it was first proposed in the 1970s, the method has been refined and applied thousands of times in many different contexts (Bengston 2016). The structured group process of the Implications Wheel facilitates "cascade thinking," that is, "how one event or implication leads to multiple possibilities, each of which in turn leads to additional possibilities" (Barker and Kenny 2010: 2). Cascade thinking helps planners and decisionmakers to proactively consider potential long-term, higher-order effects of change in order to prepare for it.

The next section describes the issue explored in this Implications Wheel exercise. This is followed by an outline of the method, and a summary of the main results. A concluding section discusses the usefulness of the method in the context of horizon scanning.

ISSUE ON THE HORIZON: GROWING APATHY TOWARD THE ENVIRONMENT

One of the salient issues that was identified in the initial phase of the Forest Futures horizon scanning project was the public's "growing apathy toward the environment in the United States." This issue has been observed in public opinion polls since the early 1990s and in various studies examining the connection between people and nature. Evidence of this issue includes the following:

- A 2016 Gallup Poll found that 42 percent of Americans identify themselves as environmentalists, down from an average of 76 percent in the late 1980s and early 1990s (Jones 2016).
- Americans express less concern about most environmental problems now than in the late 1980s and early 1990s (Jones 2016).
- A growing body of research has shown an increasing disconnect with nature in our

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society and less participation in outdoor nature recreation (e.g., Balmford et al. [2002], Louv [2005], Kareiva [2008], Zaradic [2008], Zaradic and Pergams [2007]).

- Unlike in previous campaigns, environmental issues were largely ignored during the 2016 presidential campaign, especially in the general election, in which environmental concerns were scarcely mentioned by either of the major party candidates (Dolsak and Prakash 2016).

Kareiva (2008: 2758) asserts that if current trends in attitudes toward the environment and the decline in nature-based recreation continue, they could pose "the world's greatest environmental threat" because people care for and protect what they understand and value. The long-term implications of growing apathy toward the environment could be profound, and include important consequences for public land management agencies such as the USDA Forest Service (hereafter, Forest Service). These implications are explored in this Implications Wheel exercise.

METHODS: THE IMPLICATIONS WHEEL

The word "wheel" in Implications Wheel derives from the wheel-like structure to the notes that emerges as the brainstorming process proceeds. The change of interest is placed in the center—like the hub of a wheel—and then participants generate first-, second-, and third-order implications of the change that emanate outward from the center in concentric rings.

Implications Wheel exercises are typically carried out as a group process, with participants gathered in one location at the same time. This exercise was carried out remotely and asynchronously using the Implications Wheel online software. Each participant contributed individually online at her or his convenience. Due to the small number of participants—the authors of this paper—this exercise should be considered an exploratory application of the method, with the intent to examine its usefulness and limitations in horizon scanning.

The online exercise included three rounds of generating implications (first-, second-, and third-orders) and one round to score the likelihood and desirability of each implication. Participants first familiarized themselves with the details of the central issue and reviewed the Implications Wheel rules for generating implications. For example, participants are to assume that the central issue is occurring and will continue, generate implications that are a *direct* consequence of the preceding implication, include both positive and negative implications, and ensure that implications are specific and concrete.

Round 1 was open online for 3 days, during which participants could contribute at any time. Participants suggested 32 potential first-order implications for the issue "growing apathy toward the environment in the United States." This was far too many first-orders to deal with in a small, exploratory exercise and many of the 32 proposed first-orders were not direct consequences of the central issue. Therefore, we selected the following five first-orders for exploration based on their representing broad areas of potential implications and being direct consequences of the central issue. Growing apathy toward the environment in the United States may have the following results:

1. Political support for the Forest Service and other natural resource management agencies decreases significantly,
2. Younger generations grow up more disconnected and alienated from the outdoors and the environment,
3. A massive public education campaign is launched by a coalition of environmental nonprofit organizations, educators, land managers, and others to counteract growing apathy,
4. Apathy in the United States spreads to public environmental sentiment in Europe and across the Americas, and
5. The private sector takes on a significantly greater role in environmental leadership.

Given this set of first-order implications, round 2 was open for online submission of implications for 8 days and produced 25 second-order implications, 5 for each first-order. Round 3 was also open for 8 days and produced 5 third-order implications for each of the 25 second-order implications, resulting in 125 third-order implications and a total of 155 implications.

Following identification of implications, an online scoring process was conducted in which participants subjectively rated each implication for desirability and likelihood. Scoring highlights the most important implications and points out potential opportunities and pitfalls that can be addressed by planners and decisionmakers (Schreier 2005). Each of the first-, second-, and third-order implications was scored on an 11-point desirability scale from +5 (highly positive) to -5 (highly negative), and on a 9-point likelihood scale from 1 (highly unlikely) to 9 (highly likely). Desirability scoring was carried out from the perspective of public land managers. In addition to the standard scoring categories, special categories were used to identify high impact implications. An implication deemed to have extraordinarily positive impacts is termed a "triumph" and receives a score of +50. If an implication is considered to have unusually negative consequences, it is referred to as a "catastrophe" and scored -50.

RESULTS AND DISCUSSION

In the three rounds of online Implications Wheel submissions, participants generated far more third-order implications than lower-order implications (Fig. 1). The dominance of third-order implications is due to the structure and process of the method, which shift the focus from immediate, direct implications to longer-term, indirect consequences of change. This emphasis on the longer term fits with the future-oriented nature of horizon scanning. Without this structure, people tend to focus on direct and short-term implications (Schreier 2011).

Figure 1.—Number of first-, second-, and third-order implications, and the share scored as positive, negative, and neutral in an Implications Wheel exercise that considered Americans' growing apathy toward the environment.

Overall, half (78) of the implications were scored as negative, 67 as positive, and 10 as neutral, not surprising given the undesirable nature of "growing apathy toward the environment." The large share of positive implications produced by a negative issue illustrates that undesirable change can present opportunities for policy and management actions that create positive change in the future.

Highly Significant Implications

Two types of highly significant implications have special relevance for planners and policymakers. First, *likely strong negatives* are implications scored as high on the 9-point likelihood scale (7, 8, or 9) and strongly negative on the 11-point desirability scale (-4 or -5). Implications that are deemed both highly likely and strongly negative call for policies or management actions designed to decrease their likelihood or mitigate their undesirable effects. Second, *unlikely strong positives* are implications scored as both unlikely (1, 2, or 3 in likelihood) and strongly positive (+4 or +5 in desirability). Implications that are both unlikely and strongly positive may require actions to increase their chances of occurring.

Participants identified 27 likely strong negatives and no unlikely strong positives. The large number of *likely strong negative* implications indicates the many ways in which the issue "growing apathy toward the environment" could produce a cascade of highly undesirable results for the environment and society, such as:

First-order: A significant decrease in political support for natural resource management agencies, leading to

Second-order: The sale of public lands, slashed research funding, privatized campgrounds that exclude low income groups with high fees, and

Third-order: Unsustainable logging and mining on former Federal lands (likely strong negative).

First-order: Younger generations become more disconnected and alienated from the outdoors, resulting in

Second-order: Growing substitution of virtual reality for real outdoor experiences, and

Third-order: Increasing social and cultural stress among 18- to 40-year-olds (likely strong negative).

First-order: The private sector takes on a significantly greater role in environmental leadership, leading to

Second-order: The economic elite beginning to purchase and manage large tracts of land as a symbol of status, and

Third-order: Many farmers and ranchers priced off their land (likely strong negative).

The preponderance of diverse *likely strong negatives* generated in this exercise suggests that the central issue is indeed a very serious threat for public lands and land managers with potentially profound implications.

Wild Cards: Catastrophes and Triumphs

Wild cards are low-probability, high-impact developments that may be positive or negative, are unexpected, and have the potential to be game-changers (Petersen and Steinmueller 2009). Wild cards often emerge in Implications Wheel exercises, usually as third-order consequences. The special scoring categories of "triumph" (+50) and "catastrophe" (-50) are used to identify positive and negative wild cards. Our participants identified two wild card implications, both catastrophes and both arising from the same first-order implication:

First-order: Growing apathy in the United States spreads to public environmental sentiment in Europe and across the Americas (-4 desirability, 4 likelihood), leading to

Second-order: The acceleration of unchecked exploitation and neglect of natural resources internationally without regard for long-term consequences (-50, Catastrophe), and

Third-order: Widespread environmental collapse, causing public panic (-50, Catastrophe).

In addition to the two catastrophes, the following three likely strong negative third-order implications were also generated from the second-order just listed:

- Climate change ravages coastal cities (-5 desirability, 8 likelihood)
- Africa bears the brunt of natural-resource overuse with massive mineral exploitation through foreign direct investment and corrupt governments (-5 desirability, 7 likelihood)
- Unenforceable international agreements to offset environmental damage become irrelevant (-5 desirability, 7 likelihood)

This is an example of how a negative issue has the potential to accelerate and spread, eventually resulting in dire consequences. Knowing this well in advance, managers and other decisionmakers can monitor the issue and its possible trajectories through focused horizon scanning. If needed, they can develop plans and policies to reverse the issue and avoid highly undesirable consequences. Put another way: The results of an Implications Wheel exercise are not given outcomes; they are *potential* outcomes, allowing for early action to create a different, and more desirable, future outcome.

Emerging Future Themes

Finally, a thematic content analysis was carried out on the complete set of 155 implications to identify broad themes that emerged from the exercise. The "open coding" method of qualitative content analysis was used to identify major themes. Briefly, this method involves a process of repeated and careful reading of the textual data (i.e., the 155 implications that the participants generated), developing an outline of recurring themes, and cross-referencing each theme back to the original text. See Strauss and Corbin (1998) for details on the open coding method.

We identified 10 dominant themes and examples of specific implications of each theme that were generated by participants (Table 1). The themes range from a dissolution of the role of the Federal government or the Forest Service, to a growing substitution of virtual reality for the natural world, to rising environmental activism.

This is a surprisingly wide-ranging set of desirable and undesirable themes to emerge from a single social issue, and illustrates a core principle of futures research: Numerous possible and plausible futures could unfold (Bengston 2017). Many of the themes, such as commodification and increasing conflict, exemplify unexpected consequences of the issue "growing apathy toward the environment." Others, such as innovative approaches to environmental education and rising environmental activism, show that issues may create opposing forces or countertrends that operate at the same time (Marcus 2009). The future does not unfold along one straight line, but on many paths which may contain paradox and contradiction. The dynamic nature of emerging issues points out the importance of not viewing them as inevitable and instead actively looking for indicators of potential countervailing forces that could emerge and alter the direction of change (Weiner and Brown 2005).

CONCLUSIONS

This has been an exploratory application of the Implications Wheel with the goal of investigating its usefulness in the context of horizon scanning. We found that even a quick, small-scale application of the method can uncover many useful insights: 155 implications were generated, including many of high significance (i.e., those scored as likely and strongly negative, unlikely and strongly positive, and wild cards). Surprisingly diverse and wide-ranging themes emerged from a single issue, pointing to many potential dimensions of the future that are possible and plausible.

Conducting the exercise remotely and asynchronously—using the Implications Wheel online software—allowed us to include participants who were widely separated geographically, thus eliminating travel costs. Participants were able to join in the exercise at a time and place convenient for them. This is an important advantage that allows busy individuals to participate. A drawback of conducting the exercise online is a lack of direct interaction

Table 1.—Ten broad themes that emerged from the Implications Wheel exercise, and examples of implications related to each theme

Dissolution: deterioration of aspects of the Federal government or the USDA Forest Service • The Forest Service is disbanded as a Federal agency with powers given back to the States to manage existing Federal land resources • The research arm of the Forest Service becomes part of the U.S. Geological Survey
Privatization: shift away from the public sector • The Forest Service and other natural resource agencies are combined, fully privatized, and operated on a for-profit basis • Privatized campgrounds and hiking paths impose high user fees that exclude low income groups who are unable to pay
Global cooperation: extension or engagement across borders • International exchange programs significantly boost innovative approaches to sustainable natural resource management • The United States increases global environmental actions and collaboration because of the global reach and connections of the "green party"
Virtualization: replacement of the "real" or the natural • Virtual reality (VR) increasingly substitutes for real outdoor experiences • A significant and growing number of people become addicted to VR, spending most of their time socially isolated in VR
Rebellion: opposition to dominant norms or authority • Outdoor experiences become the counterculture, especially among rebellious teenagers • Younger generations rebel against the environmental apathy displayed by their parents and society at large
Education: innovations in environmental learning • Harkening back to the success of recycling programs in early childhood education, environmental nongovernmental organizations focus primarily on grade school intervention • Law schools strengthen their environmental law curriculum in response to increased litigation in the area of environmental justice
Activism: direct vigorous involvement to bring about change • Before the land is sold, protesters in many locations around the country create encampments on public lands to prevent sales • A grass-roots coalition sues the U.S. government on behalf of children and future generations for increasing neglect of the environment
International conflict: clash between countries • Existing international environmental agreements are negated, defunded, or deeply revised and plans for future agreements are halted • Countries are markedly divided into pro- and anti-environmental agreements. Geopolitical powers play a key role
Solidarity: unity or agreement of feeling or action • Local and regional solutions to immediate problems (such as sea-level rise) begin to emerge throughout the world • Environmental conditions reach a tipping point that triggers a growing shift away from environmental apathy
Commodification: treating nature as a product that can be bought and sold • Different tiers of forest membership are created, based on ability to pay for outdoor experiences • The Forest Service commercializes water, air, carbon, wildlife, and recreation

between participants that occurs when they are gathered at one time and in one place. But we found that some of the benefits of direct interaction and brainstorming were maintained in the online context, as participants saw the ideas contributed by others, which stimulated their own creative thoughts.

Given the large number of potentially important emerging issues generated in ongoing horizon scanning, multiple rapid and small-scale Implications Wheel exercises similar to the one described here could be carried out to quickly generate potential implications and explore possibilities. Such "mini-wheels" could produce useful foresight in a timely and cost-effective manner.

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