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Towards Landscape Integrity: The Integration of Ecological and Social Frameworks in Open Space Planning

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Introduction

A dichotomy of community versus conservation has long been present in society (Agrawal and Gibson 1999). This dichotomy suggests communities and ecological systems function without dependency on each other. Open space planning efforts have reinforced this dichotomy, as they typically focus on either socially- or ecologically-based frameworks (Maruani and Amit-Cohen 2007).

This study examines the trend of incorporating both social and ecological frameworks into one open space plan. The research is exploratory, attempting to identify best practices and larger concepts related to integrated open space planning in the context of Hellmund and Smith's "landscape integrity," where healthy social and ecological systems must function together to have integrity (2006, 6).

Goals and Objectives

The purpose of this paper is to provide a holistic perspective on the state of integrated open space planning. To accomplish this, our research systematically employs a mixed-methods approach to examine the views of practitioners (practice) and the literature (theory) in an effort to guide future research efforts and to increase on-the-ground protection of open space. Specifically, this paper aims to (a) provide a holistic perspective framed by practitioner and theoretical views of the pressures, state(s) and responses affecting integrated open space planning, (b) identify a suite of theoretical and practical best practices for implementing integrated open space planning, and (c) document the similarities, differences and gaps between theory and practice in this field.

This work is organized under an adapted pressure-state-response (PSR) framework (figure 1), which provides structure to explore the state and potential future directions of integrated open space planning. As discussed by Berry (1998), the framework consists of three iterative cycles – pressure, representing human influence on the environment; state, or the current condition of the environment; and response, how society responds to the state. In this research, pressures include social and ecological forces driving open space planning. The state represents current innovations, both from theoretical and practitioner perspectives. Finally, the response builds on the knowledge gained in the study, revealing gaps between theory and practice, and examining how open space planning will need to adapt (or respond) to protect landscape integrity.

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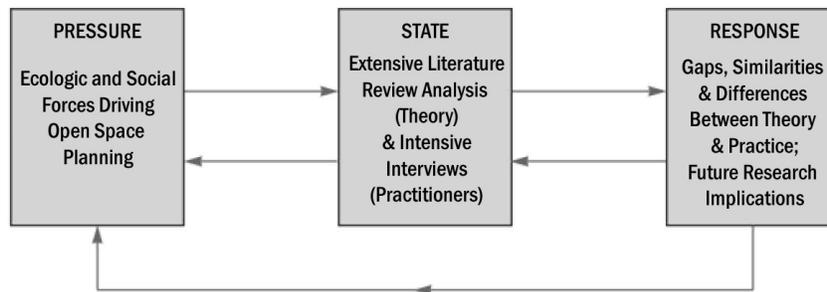


Figure 1. The pressure-state-response framework in relation to this study’s methodology (adapted from Berry 1998).

Literature Review

According to James et al. (2009), theoretical uncertainty in open space planning has an impact on the effectiveness of tools intended to meet the needs of our changing landscapes. From an ecological perspective, existing conservation policies may be increasing degradation through “leapfrog development” from conservation policies such as conservation subdivisions or downzoning that may increase fragmentation (Wu 2006, 307). In the social realm, concerns exist that open space planning tools create inequitable urban environments, where minorities and low-income individuals are disproportionately afforded access to open space (Vandegrift and Yoked 2004). It is also clear communities lack a wide range of open space planning methods that lead to successful implementation (Waldner 2009). Researchers have called for examining “innovative planning techniques” that increase success (Lachapelle et al. 2003) and integrate ecological and social frameworks in planning models (Groves 2008). Heeding this call, several researchers evaluated how social and ecological planning processes can be addressed at the municipal or regional level, where these processes of change predominate (Miller et al. 2009, Pierce et al. 2005).

Additional efforts have documented how practitioners and researchers are incorporating the concepts of both frameworks into everyday planning, such as the incorporation of participatory planning into ecologically-based open space planning (e.g., Tippett et al. 2007) or landscape ecology principles into socially-based open space planning efforts (e.g., Yahner et al. 1995). Yet, the majority of our knowledge of integrated open space planning comes from individual case studies; a synthesized toolbox for how to practice in this planning field is lacking.

Methodology

To accomplish the goal of providing a holistic (whole system) perspective on the state of integrated open space planning, a mixed-methods approach was applied to understand the integrative concepts and practices associated with the state of open space planning. Five academic professionals in three academic disciplines reviewed this study’s methods to ensure the soundness of measurement tools and data sources.

Grounded theory is the dominant research paradigm employed in this study (Glaser and Strauss 1967). As a qualitative research method, grounded theory asks the fundamental questions: “what is happening” and “what are people doing?” (Charmaz 2000, 514). Thus, grounded theory is an appropriate strategy of inquiry, as this study seeks to assess and construct theoretical concepts relating how each of these planning efforts is (or is not) achieving landscape integrity.

One foundational tenet in the creation of a grounded theory is to reach “theoretical saturation” (Glaser and Strauss 1967, 61), where researchers must sample multiple categories and maximize their differences so that no new ideas are presented by further research. To meet this criterion, a supporting research paradigm (the Likert scale metric, see below) and multiple data sources were employed (practitioner interviews and the literature from a breadth of journals) to achieve theoretical saturation. The 5-point Likert scale metric (hereafter “Likert metric”) identified the strength of support the respondents gave to a specific idea. Rankings were assigned to passages within the transcripts and literature, ranging from a rank of 1 (a topic to avoid) to 5 (indicating a practice that must be included within open space planning efforts). These ranking were useful in understanding which practices are central to the practice of integrated open space planning.

In addition to supporting research methods, two data sources were employed to understand the state of integrated open space planning: interviews of practitioners (practice) and a systematic literature review (theory). The interviews focused on two integrated models of open-space planning: Green Infrastructure, and CEDAR (an acronym for the five types of open space within this planning model). While Green Infrastructure is driven by ecological concerns and seeks to unify a community’s ecological and social networks (green infrastructure) under one plan, CEDAR is driven by social concerns and incorporates ecological networks into its open space planning efforts. Whereas Green Infrastructure is a nationally-accepted model, the CEDAR model was developed in Utah (by Sumner Swaner, a landscape architect) and tested only in one adjacent state.

The literature review entailed a four-phase selection process of journal selection, article search, article screening, and article selection. Journals were selected to cover the breadth of integrated open space planning (based on a categorization from Gobster et al. 2010), while articles were selected through a keyword search using the sub-categories that arose from the interviews. As the field of practitioners interviewed was limited to the Western United States, the literature review was limited to the United States. Please contact the authors for a full description of the articles reviewed and a detailed selection methodology.

Data analyses were conducted in two stages. The first stage included individual analysis of the interviews and literature. All interviews were audio-recorded and transcribed verbatim by the primary author. The interviews and literature were then coded from a conceptual perspective (grounded theory) and to assess strength to each statement (Likert metric). In the second stage, the concepts were united under

one grounded theory, and the Likert metric findings were analyzed using Mann Whitney *U* tests with SPSS Software (SPSS 2007). Intercoding reliability tests for each of these methods achieved 87.1% agreement for the grounded theory concepts and an 85.7% agreement rate for the Likert metric.

Results

Fourteen interviews of professionals practicing either the CEDAR ($n = 5$) or Green Infrastructure ($n = 9$) planning models and 55 articles were studied to understand the state of integrated open space planning. In this research, 3,451 coding mentions were extracted from 1,197 pages of research (interview transcriptions and literature). From these coding results, thirty-six sub-categories, six categories, and three core categories were established. The findings from this study were classified in an adapted pressure-state-response framework (figure 2).

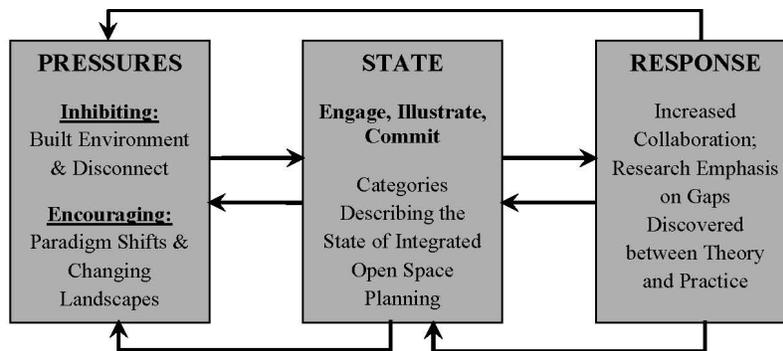


Figure 2: The findings from this study, as illustrated through the pressure state response framework. Pressures were identified that both inhibit and encourage the current state of integrated open space planning. For the state, coding mentions were categorized into three categories: Engage, Illustrate, and Commit. Finally, responses indicate potential future directions, whether indicated in the literature or the interviews. Arrows indicate the cyclical nature of the process.

This research identified pressures that served as both barriers and facilitators to integrated open space planning. Specific barriers included the homogenization of species across urban areas, insufficient planning and policies to address complex and dynamic modern problems, and the reactive nature of the planning process. Not surprisingly, categories that were considered barriers also had the lowest average medians on the Likert metric (ranging from 1.7 to 2.5), indicating these sub-categories are concerns both to interview participants and the reviewed literature.

By contrast, two pressures were seen as forces pushing practitioners toward integrated open space planning: ‘changing landscapes’ and ‘paradigm shifts.’ ‘Changing landscapes’ refers to the way rapidly changing landscapes are forcing practitioners and researchers to be more innovative and integrative. ‘Paradigm shifts’ refers to the need to see the world in a fundamentally new way, including

new roles for planning and science and increased optimism in practitioners' work. Though only 122 coding mentions were recorded for this category (out of 3,451 in the study, or 3.5%), mentions were recorded from 11 out of the 14 interviews and 31 out of 55 articles, indicating their pervasiveness in this research.

The state of integrated open space planning had the majority of the grounded theory coding mentions (2,851 out of 3,451, or 82.6%) and was categorized into 30 sub-categories and three overarching categories: Engage, Illustrate, and Commit. The 30 sub-categories highlight a range of tools, practices, and processes that practitioners and the literature are employing in studies aimed at understanding or achieving

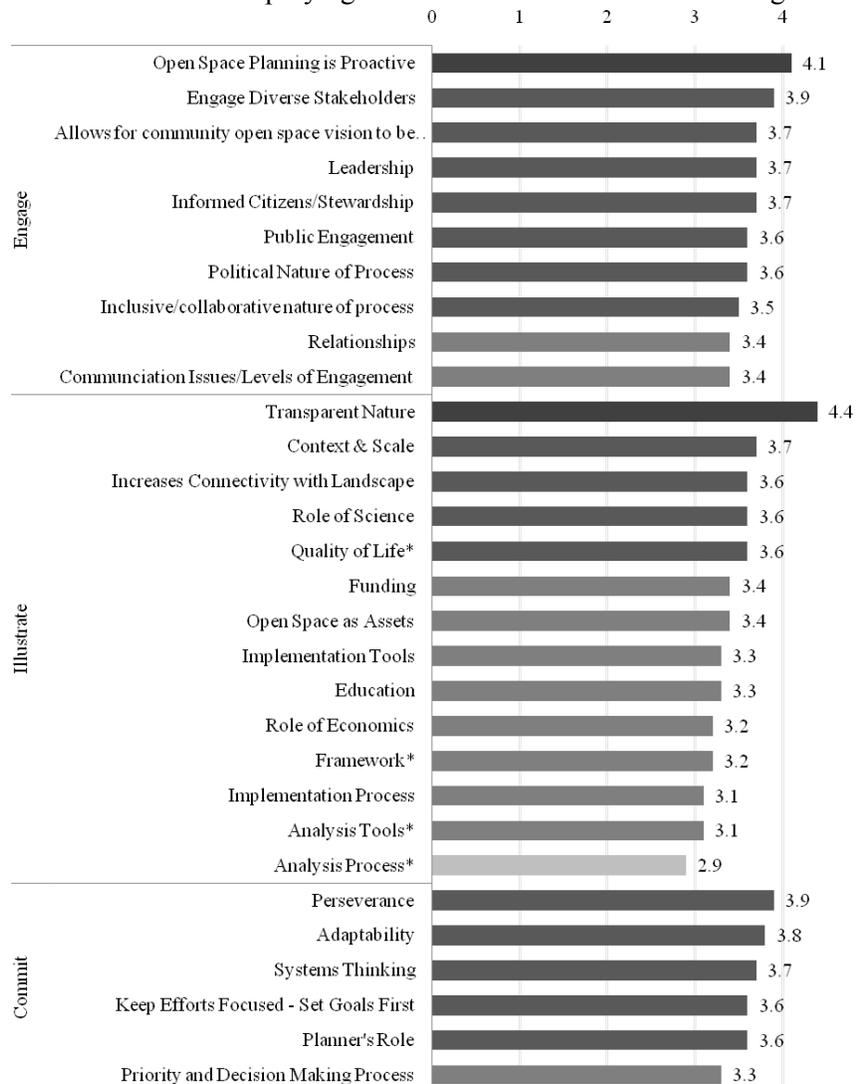


Figure 3: Likert scale metric results for the 30 sub-categories in the State of Integrated Open Space Planning. (*) indicates average medians were statistically different ($p < 0.05$) between the literature and practitioners.

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landscape integrity. For these 30 sub-categories, the Likert metric ranking ranged from 2.9 to 4.4 (figure 3). Note the sub-categories “Transparent Nature” and “Open Space Planning is Proactive” have the highest average medians (4.1 and 4.4, respectively), indicating their importance to integrated open space planning.

While sub-categories within the Engage and Illustrate categories may be familiar to most planners, the category Commit is represented to a lesser degree in existing theory. The Commit category highlights the need for adaptability, risk-taking and perseverance within more integrated forms of open space planning. These concepts appear to contrast with the most dominant planning model practiced today (in the United States) – the rational planning model (Lachapelle et al. 2003) – where goal and priority setting at the start of a project are paramount.

At the same time, research participants indicated efforts still need to be focused (outcome-oriented), though participants emphasized flexibility in allowing project outcomes to respond to changing project needs. As one participant commented,

“You’d asked me before about setting priorities, but a lot of these are external factors, that come at you, that you really can have the best strategic plan in the world but as things evolve you have to be flexible”
– Green Infrastructure participant.

These findings also highlight the role systems thinking can play in helping planners adapt to complexity. While most participants discussed the need for thinking holistically in their own field, one article suggested science may need to be more integrative as well:

“This would mean a change in science - from an emphasis on analysis and reductionism toward a goal of synthesis and integration that challenges conventional norms of scientific adequacy” –Nassauer and Opdam 2008

Thus, while the static nature (inflexibility) of planning was identified as a pressure inhibiting the movement toward more integrated forms of open space planning, this category suggests a more complex role for planning, acknowledging that efforts must be complex and adaptable yet still remain focused.

Overall findings indicate a high degree of similarity between the interviews and literature. As measured by the Likert metric, only four of the 36 sub-categories were statistically different between the interviews and the literature, which reinforces the concepts discovered in the grounded theory and provides insight into how theory and practice view each of these planning tools.

Discussion and Conclusion

This study created a conceptual framework to bridge what have been traditionally separate efforts – ecologically- and socially-based open space planning (Maruani and Amit-Cohen 2007). For the first time in the field of integrated open space

planning, ecological and social efforts were united using a comprehensive framework that crossed practical and theoretical boundaries.

From this framework, the Response category of the PSR framework took shape. Two findings were clear. First, open space planning practitioners and the literature viewed components of the existing planning framework as barriers inhibiting the more complex, holistic perspectives required in an integrated effort. However, multiple interview participants discussed the need to piecemeal their process in order to get the overall ideas accepted into policy and planning documents, even while practicing integrated forms of open space planning. Thus, while these findings create a holistic framework, future research is needed to more deeply explore how the barriers of the existing planning framework hinder integrated open space planning efforts.

Second, this research coalesced work conducted by the practitioners and literature studied here into a synergistic toolbox from which systematic planning and implementation of integrated open space planning can become institutionalized. Key elements in this new framework include the use of multiple planning tools, the ability to implement systems thinking in planning actions, and the importance of adaptability and perseverance in light of changing landscapes.

Yet, the notions of adaptability and risk-taking within this research deserve further attention as they include one of the fundamental shifts away from the barriers identified within this research – the idea that we can no longer plan for a static world. While moving forward in light of uncertainty has always been a characteristic of the planning field (Kato and Ahern 2008), these authors also note that fear and risk-taking may be “perhaps the greatest challenge to implementing adaptive planning” (549). But these notions may be undergoing a shift. One example comes from Tasan-Kok (2008), where she notes that while “flexibility” was originally viewed as a weakness in planning, it is increasingly viewed positively as form of creativity. Nonetheless, more concrete ideas and practical tools are needed if adaptive management techniques are to become institutionalized.

This study found two integrated open space planning models and a breadth of literature supporting a movement away from the community versus conservation dichotomy (Agrawal and Gibson 1999). While this movement is not yet mainstream, both paradigm shifts and the rapidly changing landscapes in which we live are reinforcing this trend. With the expanded view and holistic framework, illustrated by this research, planners are afforded a similar language upon which they can discuss the tools and processes central to integrated open space planning.

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