Chapter 5
History and Evolution of the Journal *Landscape Ecology*

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Introduction

Since their first appearance in the seventeenth century, peer-reviewed journals have played an instrumental role in advancing science (Meadows 1985; Day 1989; Wu 2011). To paraphrase Day and Gastel (2006), a scientific study is not completed before its results have been published in a peer-reviewed outlet. When a new field of study is emerging, it may be difficult for the researchers to find a place to publish their results. Thus, whether a discipline has a well-established journal is often considered an important indicator for assessing its maturity. Landscape ecologists had their days when finding a mainstream journal to publish their results was challenging, but to their credit those days are gone. Today, landscape ecologists have a well-established journal of their own, *Landscape Ecology*. For 25 years, the journal has documented what landscape ecologists do, how they do it, and what they find. The pages of the journal, therefore, are an important part in recording the development of this field.

The dominant intellectual environment at the time usually facilitates the establishment of a new field of study or its flagship journal. What was the academic environment that promoted the "globalization" of landscape ecology and the launching of the journal *Landscape Ecology*? Several fascinating personal accounts of the early developments of landscape ecology in North America are found elsewhere in this book (see Chaps. 2, 3, and 4). Here, I would like to briefly discuss some of the important historical developments in ecology that have profoundly shaped my (and, I am sure, many others') understanding of landscape ecology during the past few decades.

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G. W. Barrett et al. (eds.), *History of Landscape Ecology in the United States,*
DOI 10.1007/978-1-4939-2275-8_5

The early 1980s was an intriguing and somewhat perplexing period in the history of ecology, characterized by rapidly mounting evidence refuting some long-held ecological theories, heated debates on fundamental ecological principles and methodologies, and groundbreaking ideas that profoundly reshaped ecological thinking. The ecological historian and scientist McIntosh (1987) described the state of ecology in the early 1980s as follows:

> Ecologists are in a period of retrenchment, soul searching, "extraordinary introspection" (Shapiro 1985), or "presenting introspective examinations at an alarming rate" (Lehman 1986). This follows on nearly three decades of heady belief on the part of some ecologists, newly ventured into the maze of community ecology, that communities are structured in an orderly predictable manner, and of others that Information Theory, systems analysis, and mathematical models would transform ecology into a "hard" science.

In the 1950s and 1960s, a dominant view in ecology was that there were general or universal patterns among biological populations and communities regardless of their abiotic and biotic environments and history. Although different views had always existed, skepticism and criticisms became heightened in the late 1970s and early 1980s, subsequently leading to a shift in ecological thinking (McIntosh 1987; Wu and Loucks 1995). It became increasingly clear to ecologists that mathematically elegant equilibrium theories and models have little realism because nonlinearities, transient processes, and historical legacies frequently play key roles in real ecosystems. Universal laws are few, if any, in ecology because spatial heterogeneity and idiosyncratic system properties are often found to be essential to meaningful generalizations. This does not mean that searching for generalities in ecology should be discouraged, but rather generalities ought to be understood in a place-based context, which often takes the form of a landscape.

In the 1980s, patch dynamics, a perspective that emphasizes transient dynamics and disturbances in ecological systems, became widely accepted (Levin and Pain 1974; Levin 1976; Wiens 1976; Pickett and Thompson 1978; Pickett and White 1985; Turner 1987; Levin et al. 1993). The theory of island biogeography was widely (and only heuristically in many cases) applied in studying the effects of landscape fragmentation on biodiversity and ecological processes (Forman et al. 1976; Burgess and Sharpe 1981; Harris 1984). Ecologists began to realize that "[we] also need to erase from our minds the concept of a pristine world in static equilibrium, and recognize that biological changes and human interactions have been an ongoing process" (Golley 1987). At the same time, "an ecology of the landscape," with the patch–corridor–matrix model as a "spatial language," was developed to understand "the spatial heterogeneity of energy, nutrients, water, plants, and animals at the level of a landscape" (Forman 1981, 1983; Forman and Godron 1981, 1986).

Once spatial heterogeneity is emphasized, scale matters. The hierarchy theory, especially through the publications of Tim Allen, Bob O'Neill, and their affiliates (Allen and Starr 1982; O'Neill et al. 1986), increased ecologists' awareness of the importance of scale in space and time, as well as the necessity of linking pattern and process across multiple organizational levels of ecological systems. Different forms of patchiness from within local ecosystems to broad-scale watersheds manifest themselves on a range of scales and interact with each other, begetting a

hierarchical perspective on the patterns and processes of ecological systems (Pickett et al. 1987; Urban et al. 1987; Levin 1992; Wu and Loucks 1995). For example, to fully understand the structure, function, and significance of an ecosystem, its interactions with neighboring ecosystems and the landscape matrix must be explicitly considered (e.g., Golley 1987). Remote sensing data and geographic information systems (GIS), indispensable for analyzing spatial patterns on broad scales, also became widely accessible to ecologists (Iverson 2007). Many of these new ideas were brought together at the historic Allerton Park Workshop in 1983 (Risser et al. 1984; Risser 1995), which "established something of a 'new paradigm' for landscape ecology" (Wiens 2008).

All of the abovementioned developments in ecology together created an intellectual environment that made it possible for landscape ecology—a field of study that had been practiced in central Europe since 1939—to take roots and take off in North America and across the rest of the world in the 1980s. The earlier European perspectives were focused heavily on land surveying and mapping, land-use planning and management, and human–land relationships. The modern landscape ecology was born in the 1980s as the new conceptual developments in ecology (particularly those related to spatial heterogeneity) and technological advances in computation (especially remote sensing and GIS) were incorporated into the field. In this new phase, landscape ecology was rejuvenated and characterized by a series of new concepts and theories (e.g., the patch–corridor–matrix model, patch dynamics, boundary dynamics, metapopulations, percolation theory, and hierarchy theory), as well as quantitative methods (e.g., pattern metrics and spatial models).

Founding of the Journal Landscape Ecology

As the ideas of heterogeneity and the techniques of spatial pattern analysis became increasingly widespread in ecology and related fields, the 1980s turned into a golden era for the development of landscape ecology. The International Association for Landscape Ecology (IALE) was established in 1982, primarily a result of the concerted efforts by European ecologists and geographers. A historic workshop was held in Allerton Park, IL, United States in 1983, which produced a spatial heterogeneity-oriented blueprint for modern landscape ecology. Two classic books—*Landscape Ecology: Theory and Application* coauthored by Naveh and Lieberman (1984) and *Landscape Ecology* coauthored by Forman and Godron (1986)—were then published. Also in 1986, the First United States Landscape Ecology Symposium was held in Athens, University of Georgia (see Chap. 4).

In July 1987, the journal *Landscape Ecology* was launched by SPB Academic Publishing with founding editor in chief Frank B. Golley (Fig. 5.1). This was undoubtedly an important milestone in the history of the field. As Monica Turner recalls, "Scientifically, *Landscape Ecology* provided the first outlet for papers in this area, at a time when such papers were receiving resounding rejections from other mainstream journals in ecology" (personal communication). As a world-renowned

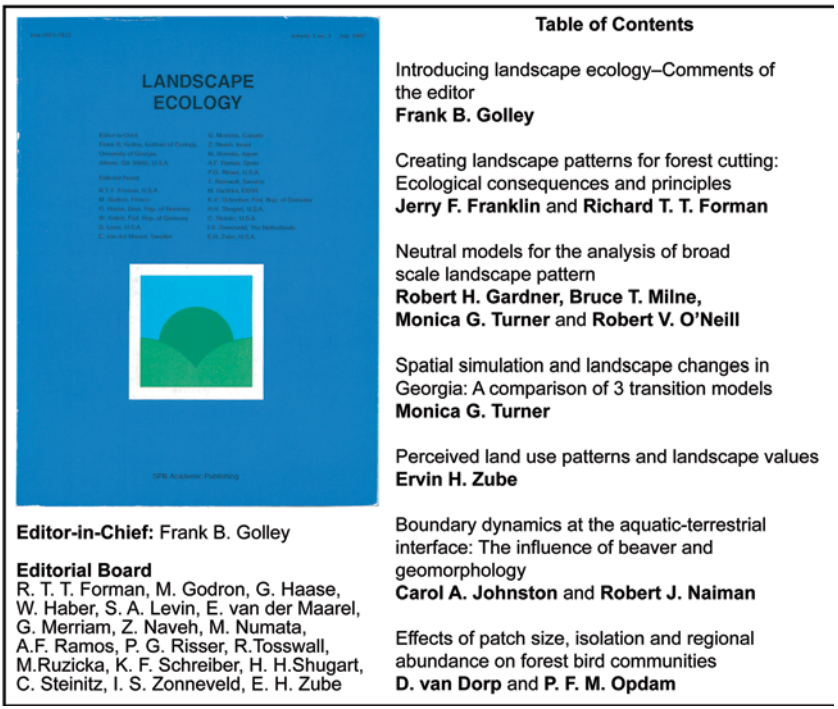

Fig. 5.1 Journal cover of the inaugural issue of *Landscape Ecology* published in July 1987. The first editorial board consisted of 18 members, and the first issue included 7 articles, including the editorial by the Editor-In-Chief

ecosystem ecologist, and then president of International Association for Ecology (INTECOL, 1986–1990), Frank Golley provided leadership essential in the founding of the journal. It was his vision that ensured the journal to be interdisciplinary and global from its very beginning.

Since 1987, *Landscape Ecology* has been the flagship journal of IALE. In his inaugural editorial, Golley (1987) described the aims and scope of the journal as:

> IALE membership includes landscape designers, architects, and planners, as well as soil scientists, geographers, modelers, and those biologists who call themselves ecologists. The journal is intended to be the official voice of IALE and to represent these various disciplines' interests and research on the landscape. Landscape sets the scale and orientation of the journal. Ecology indicates its breadth and holistic approach…. The task of correcting biospheric disorder is a universal activity, requiring information and insight from all. We intend that *Landscape Ecology* have this broad objective and that it be relevant to the problems that face [humankind] at the end of the twentieth century.

The guidelines are in line with the original vision of Troll (1939, 1971), which called for landscape ecology to be "the study of the main complex causal relationships between the life communities and their environment…expressed regionally in a definite distribution pattern (landscape mosaic, landscape pattern)" (Troll 1971).

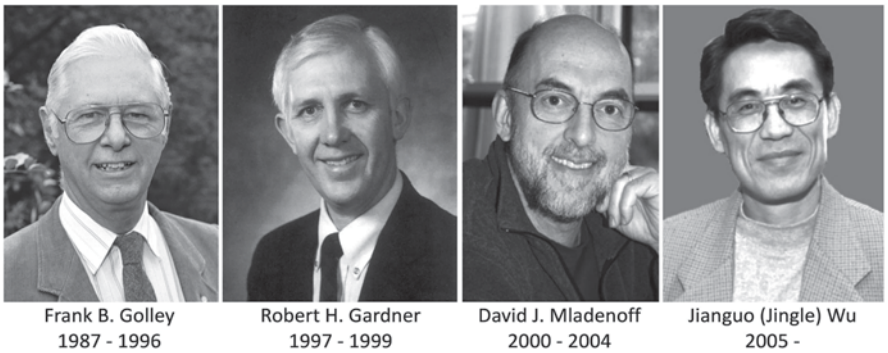

Fig. 5.2 Editors-In-Chief of the journal *Landscape Ecology* from 1987 to present

The emphasis on the ecological effects of landscape patterning, interdisciplinarity, and broad spatial scales has been a salient characteristic of the journal since its founding in 1987.

Succession of Editors and Publishers

Since 1987, *Landscape Ecology* has flourished with a steady increase in the quantity and quality of published articles, with a succession of editors, publishers, and reviewers. The journal has had four editors in chief in its 25-year history (Fig. 5.2). After serving as the founding editor in chief for 10 years, Frank Golley handed over the reins to Robert Gardner in 1997 (Gardner 1996; Golley 1996). Three years later, David Mladenoff succeeded Bob Gardner in 2000 (Mladenoff 2000). Since the beginning of 2005, Jianguo (Jingle) Wu has been the editor in chief of the journal (Wu 2005). Golley and Gardner played an instrumental role in the early development of landscape ecology in North America. David Mladenoff did an outstanding job as the editor in chief for 5 years, and improved the journal in a number of ways by working closely with the publishing staff and editorial board members. Under the leadership of David, the number of manuscript submissions and the rejection rate increased substantially, resulting in a considerable improvement in the overall quality of published articles in the journal. All four editors in chief have been honored with the Distinguished Landscape Ecologist Award by US Regional Association of the International Association for Landscape Ecology (USIALE; Golley in 1991, Gardner in 1994, Wu in 2010, Mladenoff in 2012).

With the growth of the journal and changes in editorship, the size and composition of the editorial board have also changed substantially over the years. The first editorial board established in 1987 consisted of 18 people from 10 countries (Fig. 5.1). Today, the board comprises 48 scientists from 14 countries (Fig. 5.3). Between 1987 and 2012, a total of 136 scientists have served on the editorial board of the journal for different durations. Among them, 16 people served the journal

Fig. 5.3 Members of the Editorial Board of *Landscape Ecology* who were at the 2007 World Congress in Wageningen, the Netherlands. From left to right: J. D. Wickham, J. A. G. Jaeger, K. Riitters, T. Wiegand, M. Antrop, H. Wagner, J. Ahern, A. Farina, J. Wu, J. Niemelä, T. Esplin (Springer), J. Breuste, C. Cotton (Springer), U. Mander, J. Ludwig, F. Kienast, J. Baudry, P. Opdam, R. Jongman, and J. P. Metzger

Fig. 5.4 Changes in the journal cover of *Landscape Ecology*. The current photo-mosaic format was adopted in 2005, and the nine photos comprising the mosaic have been replaced each year since 2007

for 10 or more years, and about 50 people served for 5–9 years, as of May 2012. In addition to the editorial board, the advisory board of the journal was first established in 1998, dissolved by the end of 1999, and reestablished in 2007. The dedication and diligent work of all the members of the editorial board and the editorial office at the publisher, as well as a greater number of reviewers and readers, have been instrumental to the growth and success of the journal.

Since 1987, the journal has had three different publishers, and these transitions were complex, and negatively affected the production of the journal for several months or longer. From 1987 to 1997, the journal was published by SPB Academic Publishing, which was succeeded by Kluwer Academic Publishers in 2000. Following the merger of Kluwer with Springer in 2005, the journal has been published by Springer ever since. With each change of publishers, the printed version of the journal cover has also changed (Fig. 5.4). Bob Gardner "deserves great credit for guiding the journal through complex transitions" during his tenure as the editor in

chief for 3 years between 1997 and 1999 (Mladenoff 2000). Of course, Bob also was one of the key players who helped establish modern landscape ecology. David Mladenoff did a marvelous job of guiding the journal successfully in the aftermath of the transition from SPB to Kluwer, and the unpredictable foreshocks of the Kluwer and Springer merger. As paper submissions were only eliminated around 2004, all three former editors in chief had to deal with hard-copy manuscripts.

Performance of the Journal by Numbers

The journal has grown substantially in terms of the numbers of published articles and pages each year since 1987. *Landscape Ecology* started with one volume with four issues a year in 1987. The number of issues per year increased to six in 1995, eight in 2000, and ten in 2007. As the total number of manuscript submissions per year increased from about 97 in 2000 to 486 in 2011, the total numbers of articles and pages published each year also increased rapidly (Fig. 5.5).

The average number of articles published per year was 33 for the period of 1987–1996, 52 for the period of 1997–2004, and 106 for the period of 2005–2011. The average number of published pages per year increased from 325 for the period of 1987–1996 to 688 for the period of 1997–2004 and 1444 for the period of 2005–2011. The rate of increase in the number of manuscript submissions far exceeded the rate of increase in the number of the published articles on an annual basis (Fig. 5.5). This resulted in a continuously decreasing acceptance rate for the journal in recent years, although the total number of pages published each year increased substantially.

Given the history and recent developments of landscape ecology, it is not surprising that most manuscripts submitted to the journal have come from North America and Europe. For example, of all the submitted manuscripts during the period of 2005–2011, about 34 percent were from the United States, 23.4 percent from six European countries (Spain, Germany, France, UK, the Netherlands, and Italy, each contributing about 3–5 percent), 9 percent from China, 8 percent from Canada, and 6 percent from Australia (Fig. 5.6). Of the published articles in *Landscape Ecology* from 1987 to April 2012, about 50 percent came from the United States, 10 percent from Canada, and 5.4 percent from Australia. The leading European countries in this category include France, the Netherlands, Germany, Spain, UK, Sweden, Switzerland, Belgium, and Italy, each contributing about 2–7 percent to the total number of published papers (Fig. 5.6). The apparent geographic imbalance in the number of papers submitted to and published in *Landscape Ecology* is, to some extent, reflective of the uneven development of the science in different parts of the world. The good news is that this geographic imbalance has appeared to decline in recent years. This trend is likely to continue into the future.

The academic standing and influence of the journal can be assessed, in part, by comparison with other journals in ecology and related fields. One metric that has been used frequently for such a purpose is the journal impact factor published each year in Journal Citation Reports® by Thomson Reuters (http://apps.webofknowledge.com/;

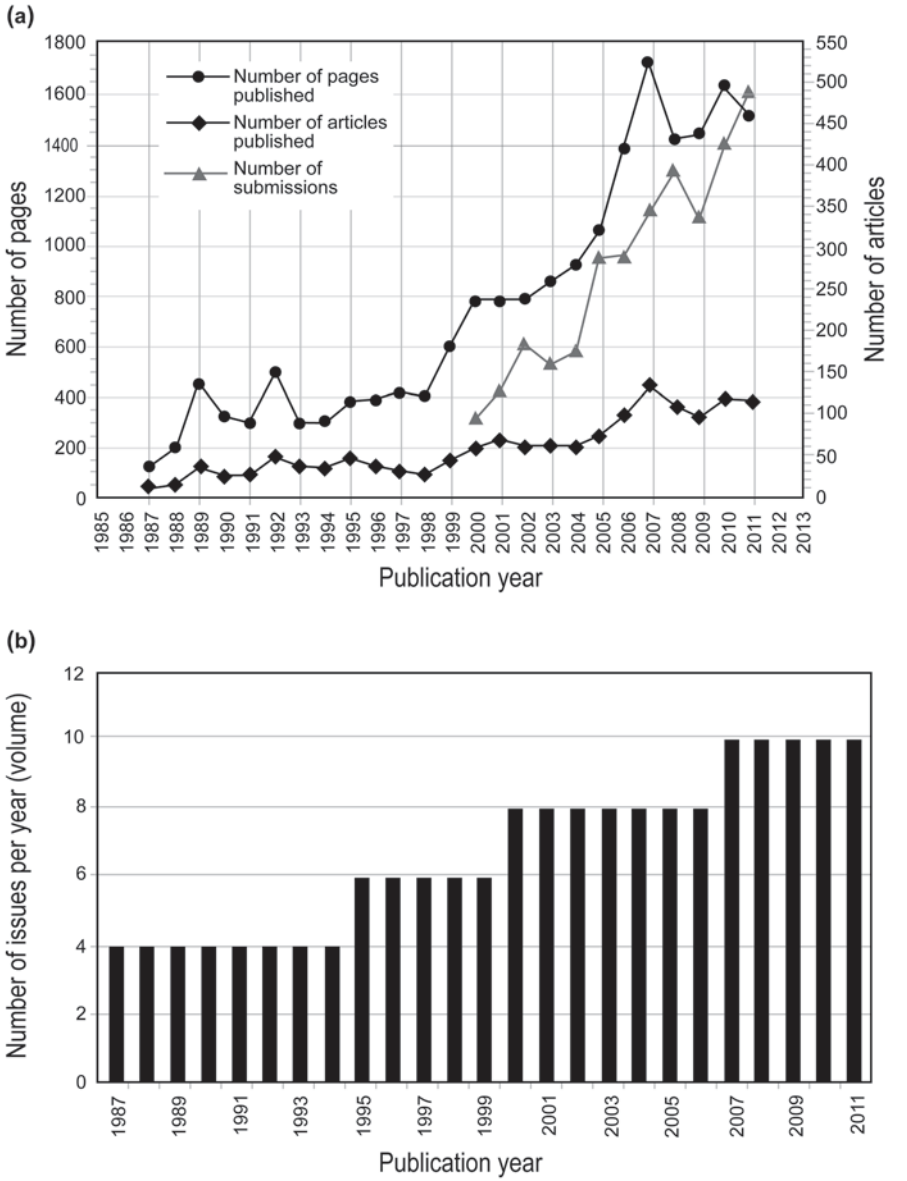

Fig. 5.5 (**a**) Numbers of published of pages, articles, and manuscript submissions per year. (**b**) Growth trend of the journal *Landscape Ecology* between 1987 and 2011, in terms of the number of issues per volume

formerly Institute for Scientific Information, ISI). The journal impact factor, like all metrics and indicators in landscape ecology, is useful but not perfect. The *Landscape Ecology* impact factor and ranking among related journals have increased steadily since it was first included into the ISI database in 1997 (Fig. 5.7). The impact factor of the journal was 1.3 in 1997, and exceeded 2 in 2004 and 3 in 2009 (Fig. 5.7a). Its overall ranking has been consistently strong and trending upward

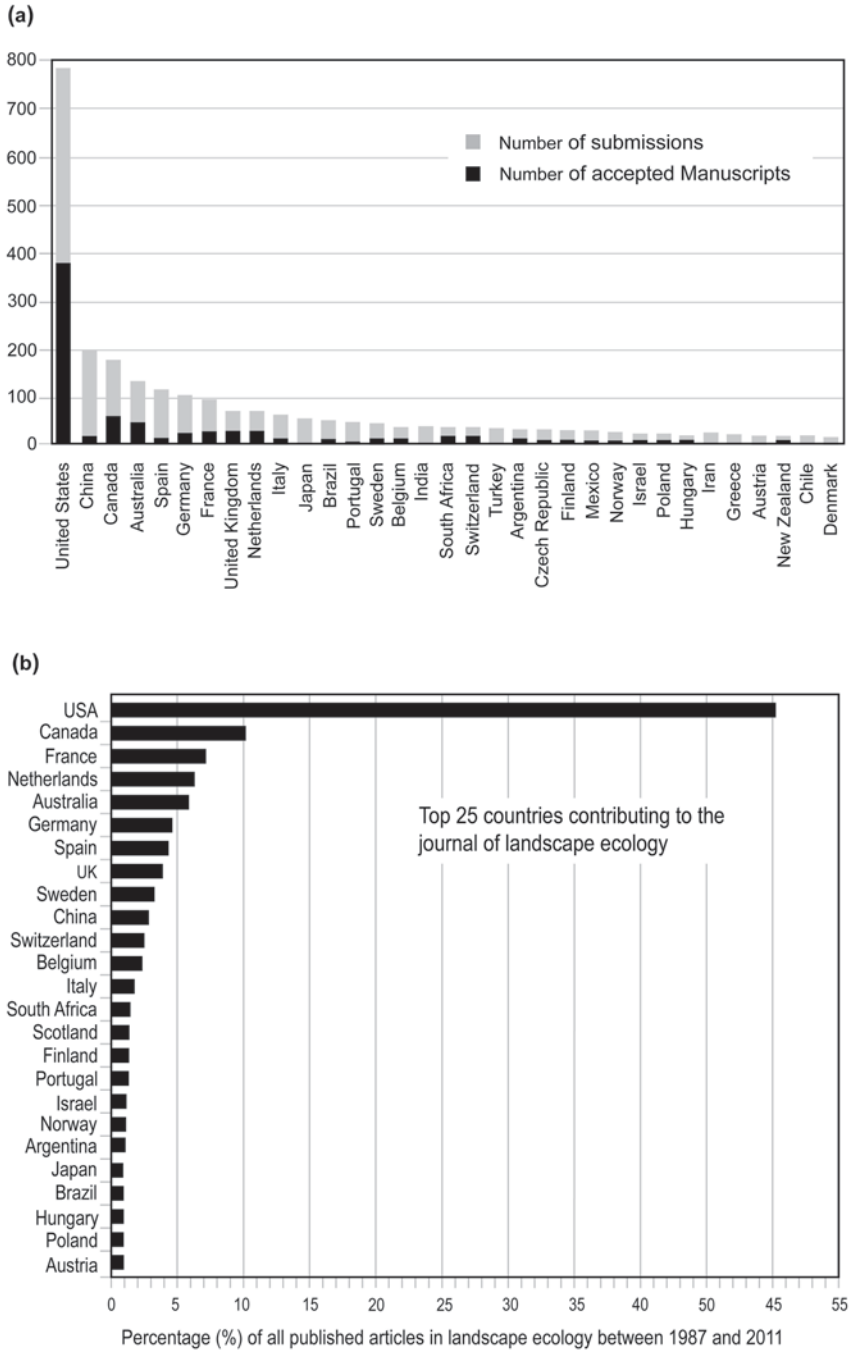

Fig. 5.6 (**a**) Numbers of manuscripts submitted to and accepted by *Landscape Ecology* each year by country, based on data between January 1, 2005, and December 31, 2011, that included only countries with 20 or more submissions. (**b**) Ranking of the top 25 countries according to the number of published articles between 2005 and 2011

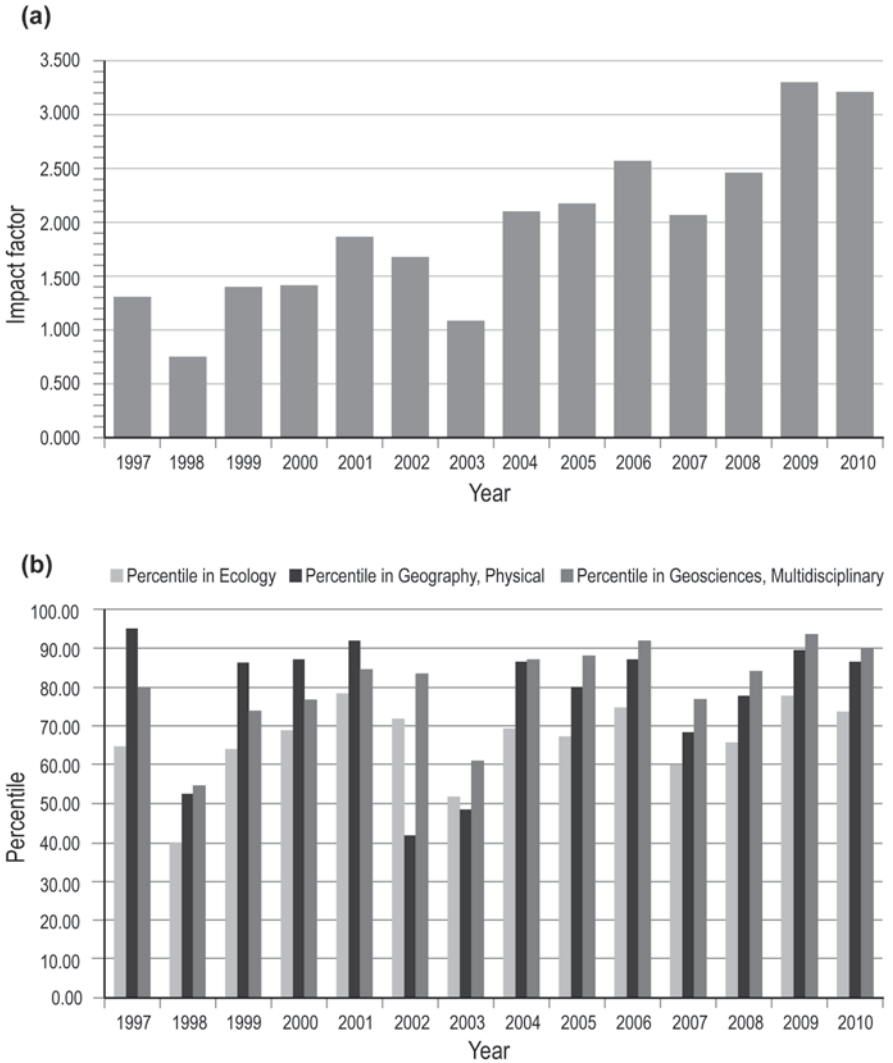

Fig. 5.7 (**a**) Impact factor of *Landscape Ecology* and (**b**) its ranking among related journals. (Data from Thomson Reuters' Web of Science)

(Fig. 5.7b). In 2009, it was ranked 4th among 36 physical geography journals, 11th among 155 multidisciplinary geosciences journals, and the 30th among 129 ecology journals. These numbers remained at similar levels in 2010 and 2011.

Research Trends Observed from the Journal

Golley (1987) pointed out that "[a] central task of the editor and editorial board is to set the boundaries of the subject matter contained in the journal." This is generally true, but the exact extent to which the editor in chief and the editorial board should (and can) define the scope and direction of the journal may be difficult to gauge. It is certain, however, that the main themes and specific research topics in the published papers of *Landscape Ecology* have continued to evolve since 1987, documenting the rapid developments of the field. It is also true that these changes have been influenced, to a significant degree, by the vision and perspectives of the editors as well as the reviewers.

Several research trends may be identified from the published pages of the journal in the past 25 years. Some of these trends were revealed by three consecutive analyses of the publications in *Landscape Ecology,* in terms of the subject focus, scale of study, level of ecological organization, research methods, and "hot" topics (Wiens 1992; Hobbs 1997; Andersen 2008). First, research themes and topics that have continued to dominate the journal pages include landscape pattern analysis, land use/land cover change, and effects of landscape fragmentation on biodiversity. The top 25 most cited papers published in the journal since 1987 (Table 5.1) seem to capture some of the key topics that have originated and persisted in the field: landscape disturbance dynamics (Franklin and Forman 1987; Andow et al. 1990; Turner et al. 1993; Turner and Romme 1994), landscape pattern quantification and interpretation (O'Neill et al. 1988; Turner 1990; Gustafson and Parker 1992; Li and Reynolds 1993; Plotnick et al. 1993; Riitters et al. 1995; Hargis et al. 1998; Li and Wu 2004), scale effects and scaling (O'Neill et al. 1989; Turner et al. 1989; Wiens and Milne 1989; Jelinski and Wu 1996; Wu 2004), neutral landscape models and critical thresholds (Gardner et al. 1987; Johnson et al. 1992), and ecological effects of landscape fragmentation (Van Dorp and Opdam 1987; Opdam 1991). In the first decade of the journal, relatively more papers dealt with conceptual issues and landscape pattern analysis. During the past decade, however, purely descriptive studies have become increasingly difficult to get into the journal. On the topics of land-use change and landscape fragmentation, increasing emphasis has been placed on the driving processes and ecological impacts. Urbanization, as the most extreme form of land use and land cover change, has become a frequent subject matter in the published studies in the journal since the late 1990s. A clear articulation of the relationship between landscape pattern and ecological processes is now generally expected in each paper published by the journal. Consequently, the relative abundance of studies focusing on ecological processes and landscape functioning has been increasing.

Second, most landscape ecological studies have been conducted on broad scales—that is, human landscapes of hundreds to thousands of square kilometers in area—although the essential ideas of landscape ecology can be applied essentially to any scale. With increasing needs for scaling up ecological information and for integrating human and environmental systems, this trend is most likely to continue.

Table 5.1 Top 25 most cited papers published in *Landscape Ecology* since 1987 (data from Web of Science; accessed on April 25, 2012). The number of 25 was picked in honor of the 25th anniversary of the journal *Landscape Ecology*

Rank	Author	Year	Article title	Volume	Start page	Total cites	Cites/ year
1	O'Neill, R; Krummel, J; Gardner, R; Sugihara, G; Jackson, B; Deangelis, D; Milne, B; Turner, M; Zygmunt, B; Christensen, S; Dale, V; Graham, R;	1988	Indices of landscape pattern	1	153	581	25.26
2	Franklin, J; Forman, R	1987	Creating landscape patterns by forest cutting: Ecological consequences and principles	1	5	446	18.58
3	Riitters, KH; O'Neill, RV; Hunsaker, CT; Wickham, JD; Yankee, DH; Timmins, SP; Jones, KB; Jackson, B	1995	A factor analysis of landscape pattern and structure metrics	10	23	362	22.63
4	Roth, NE; Allan, JD; Erickson, D	1996	Landscape influences on stream biotic integrity assessed at multiple spatial scales	11	141	358	23.87
5	Gardner, RH; Milne, BT; Turner, MG; O'Neill, RV	1987	Neutral models for the analysis of broad-scale landscape pattern	1	19	341	14.21
6	Turner, MG.; O'Neill, RV; Gardner, RH; Milne, BT	1989	Effects of changing spatial scale on the analysis of landscape pattern	3	153	337	15.32
7	Wu, J; Hobbs, R	2002	Key issues and research priorities in landscape ecology: an idiosyncratic synthesis	17	355	236	26.22
8	Turner, MG; Romme, WH	1994	Landscape dynamics in crown fire ecosystems	9	59	229	13.47
9	Hargis, CD; Bissonette, JA; David, JL	1998	The behavior of landscape metrics commonly used in the study of habitat fragmentation	13	167	225	17.31
10	Gustafson, EJ; Parker, GR	1992	Relationships between landcover proportion and indexes of landscape spatial pattern	7	101	221	11.63
11	Wiens, JA; Milne, BT	1989	Scaling of "Landscapes" in landscape ecology, or, landscape ecology from a beetle's perspective	3	87	216	9.82

Table 5.1 (continued)

Rank	Author	Year	Article title	Volume	Start page	Total cites	Cites/ year
12	Andow, DA; Kareiva, PM; Levin, SA; Okubo, A	1990	Spread of invading organisms	4	177	215	10.24
13	Wu, J	2004	Effects of changing scale on landscape pattern analysis: Scaling relations	19	125	202	28.86
14	Turner, MG	1990	Spatial and temporal analysis of landscape patterns	4	21	197	9.38
15	Van Dorp, D; Opdam, P	1987	Effects of patch size, isolation and regional abundance on forest bird communities	1	59	196	8.17
16	Li, H; Wu, J	2004	Use and misuse of landscape indices	19	389	192	27.43
17	Ludwig, JA; Tongway, DJ	1995	Spatial-organization of landscapes and its function in semiarid woodlands, Australia	10	51	180	11.25
18	Opdam, P	1991	Metapopulation theory and habitat fragmentation: A Review of holarctic breeding bird studies	5	93	175	8.75
19	Jelinski, DE; Wu, J	1996	The modifiable areal unit problem and implications for landscape ecology	11	129	174	11.60
20	Johnson, AR; Wiens, JA; Milne, BT; Crist, TO	1992	Animal movements and population-dynamics in heterogeneous landscapes	7	63	167	8.79
21	Turner, MG; Romme, WH; Gardner, RH; O'Neill, RV; Kratz, TK	1993	A revised concept of landscape equilibrium: Disturbance and stability on scaled landscapes	8	213	164	9.11
22	Pielke, RA; Avissar, R	1990	Influence of landscape structure on local and regional climate	4	133	163	7.76
23	O'Neill, RV; Johnson, AR; King, AW	1989	A hierarchical framework for the analysis of scale	3	193	162	7.36
24	Plotnick, RE; Gardner, RH; O'Neill, RV	1993	Lacunarity indexes as measures of landscape texture	8	201	161	8.94
25	Li, H; Reynolds, JF	1993	A new contagion index to quantify spatial patterns of landscapes	8	155	153	8.50

Third, the levels of ecological organization at which landscape ecological questions have been most frequently addressed include the populations of single or multiple species and the entire landscape. Studies on the structure and function of communities and ecosystems in a landscape context have been increasing slowly but steadily in the recent decade.

Fourth, in terms of ecosystem or landscape types studied, there have been an increasing number of "wet" papers that deal with rivers, lakes, and different types of wetlands. However, forests have been by far the most studied, whereas deserts and grasslands have been seriously underrepresented, considering that arid and semiarid regions cover more than 40 percent of the land area of Earth and are home to more than 35 percent of the global population.

Fifth, landscape ecological studies have relied increasingly on the use of remotely sensed data and GIS, and multiple-scale approaches have become increasingly the norm in data acquisition and analysis. Problems of spatial accuracy and uncertainty have been recognized, but little genuine progress has been made, and studies on these topics are seriously lacking.

Sixth, field manipulative experiments at the landscape scale are still relatively rare because of their conceptual and logistic challenges. However, the number of landscape-scale studies has been increasing. With heightened recognition in the roles of landscape design within landscape ecology (Nassauer and Opdam 2008), more experimental studies are expected to appear in the journal from now on, although many landscape experiments will never strictly meet the criteria of "controlled experimentation" prescribed by classic scientific inquiry. The problems of pseudo-replication and internal validity of experiments at the landscape scale need to be faced but not feared, however.

Finally, several "hot" and new topics have emerged through the pages of the journal. For example, behavioral landscape ecology—the study of the relationship between landscape pattern and behavioral processes of organisms—has remained a vibrant area for several decades. The spatiotemporal patterns and ecological effects of land use and land cover change have continued to gain new insights and momentum. In the past decade, one of the most rapidly developing areas has been landscape genetics that integrates landscape pattern analysis with population genetics (Holderegger and Wagner 2006; Balkenhol et al. 2009). Studies in this area not only contribute significantly to our basic understanding of pattern-process relations but also to the conservation of biodiversity in fragmented landscapes. Another new area of research is soundscape ecology, which integrates landscape ecology with acoustics to understand the importance of biological, geophysical, and anthropogenic sounds to landscapes as coupled human–environment systems (Pijanowski et al. 2011; Truax and Barrett 2011). In addition, with the rapid development of sustainability science since the early 2000s, the topic of landscape sustainability has received increasing attention from landscape ecologists worldwide (Wu 2006; Naveh 2007; Fu et al. 2008; Musacchio 2009; McAlpine et al. 2010; Cumming et al. 2013; Turner et al. 2013).

Conclusion

The process of scientific publishing has been essential to the advancement of science. A true test of the success of a journal is its real impacts on the development of the related science (Monica Turner, personal communication). As the flagship journal of the international association for the field, *Landscape Ecology* has served as an effective and premier forum for landscape scientists for 25 years. While many were skeptical about the legitimacy and future success of the field of landscape ecology just a few decades ago, there is little doubt that landscape ecology today is a well-established interdisciplinary field cutting across ecology, geography, and landscape architecture. Some have argued that landscape ecology now has come of age or "matured" (Turner 2005). I am less certain about the degree of maturity of the field, as its core concepts and methodology are still rapidly evolving. I am sure, however, that the journal has been not only an incubator but also an indicator, of the growth and success of the field. Its instrumental role in promoting the science is overwhelmingly evident.

With its well-established reputation as a mainstream journal in ecological and geographical sciences, *Landscape Ecology* has a bright future. In the increasingly competitive publishing world in which publishers and authors seem to be forced to chase journal impact factors, however, our journal must continue to improve to better serve landscape science, its researchers and practitioners, and society as a whole. Toward this end, I would like to conclude this chapter by discussing some of the major challenges ahead.

First, landscape ecology has become increasingly integrative and interdisciplinary, demanding broader perspectives and expertise from the editors and reviewers. As Golley (1987) pointed out at the launching of the journal, the ultimate goal of landscape ecology would be "to create landscapes which are beautiful, as well as productive of goods and services required by humans and natural creatures and to contribute to a system of values where landscapes can be assessed and protected for their intrinsic qualities and not only their economic worth." To achieve this goal, "we must form teams with historians, landscape architects, archeologists, anthropologists and other social scientists to explore these relationships" (Golley 1996). Meanwhile, the journal needs to have an identifiable scientific core. The relationship between spatial pattern and ecological processes across scales has emerged as the most central idea that this scientific core hinges upon. To embrace pluralism and maintain an identity at the same time is much harder done than said. To meet this challenge, the editor and the editorial board need to be acutely cognizant of the central theme of landscape ecology, collectively help to define the boundary, and guide the overall direction, of the field.

Second, to facilitate the development of a scientific core for landscape ecology, review and synthesis papers are critically important. The details of the core will continue to be developed and refined by the scientific community as a whole, but the guiding theme seems clear, as mentioned above. Key research questions in the field ought to be examined periodically across taxa, systems, and scales. For example,

how does spatial heterogeneity affect biodiversity? How does spatial heterogeneity affect ecological processes within and between populations, communities, and ecosystems in landscapes? How does spatial heterogeneity affect ecosystem services and the sustainability of landscapes? How can landscape ecological principles be used in, and derived from, the practice of biodiversity conservation, land design and planning, and sustainable development? After publishing more than 1500 articles in the past 25 years, *Landscape Ecology* now welcomes reviews and syntheses on both specific topics and broad themes.

Third, we need to continue our push for more papers on "landscape ecology in practice," as the ultimate goal of our science is to help achieve sustainable landscapes, even if understanding how landscapes work in and of itself is a worthy academic goal. In other words, we must make our science more "actionable" through promoting publications that demonstrate how landscape ecological knowledge is actually translated and applied on the ground (Opdam et al. 2009; Opdam 2010). As used in the field of action research or organizational learning (Argyris 1996), "actionable" means being able to be implemented or acted on by the intended users (not giving sufficient reason to take legal action!). Actionable science is "science that is motivated to serve society," which "has the potential to inform decisions (in government, business, and the household), improve the design or implementation of public policies, or influence public- or private-sector strategies, planning and behaviors that affect the environment" (Palmer 2012). Landscape is arguably the most operational spatial scale, between a study plot and the entire biosphere, for sustainability research and practice, and landscape ecology ought to be an actionable science. The "landscape ecology in practice" articles published by our journal so far have not been among the most cited, but their importance far exceeds what can be measured by any journal performance metric based solely on citations.

Finally and very importantly, the journal of *Landscape Ecology* is an important performance barometer of the field as a whole. To a large extent, the articles published in the journal reflect what landscape ecologists do and how well they do it. It is hard to image a well-established landscape ecologist today who has not published any influential papers in the flagship journal. A close scrutiny of all the published issues of the journal in the past 25 years certainly would support this claim. Thus, all of us who call ourselves landscape ecologists are obligated to contribute to the immediate improvements and long-term success of our own journal by enhancing its influence in academia and on real landscapes. A straightforward first step toward this end is to submit your best papers to *Landscape Ecology*!

Greater success will come from greater efforts from all our editors, publisher, authors, reviewers, and readers of the journal. I feel the pressure and the excitement, and look forward to working with all the parties to turn future challenges into exciting opportunities.

Acknowledgments I am enormously grateful to my predecessors—the three former editors in chief, Frank Golley, Bob Gardner, and David Mladenoff—for their outstanding contributions to

the journal. Former Associate Editor Marc Antrop, Associate Editor Paul Opdam, editorial board and advisory board members, Senior Publishing Editor Catherine Cotton at Springer, and staff at the *Landscape Ecology* editorial office are acknowledged for their excellent service. I thank Monica Turner, David Mladenoff, and Paul Opdam for providing valuable comments on an earlier version of this paper. I am privileged to dedicate this chapter to the memory of Founding Editor in Chief Frank B. Golley (1930–2006).

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