

LAND 444 Ecology of Landscapes - Fall 2009

Monday / Wednesday, 3:00 - 4:15, Clark C 359

Professor Jeff Lakey

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Office Hours: 4:30 - 5:30 pm Mondays after class or by appointment

What is Landscape Ecology?

Landscape ecology is the study of the forms of, and interactions between, physical, chemical, and biological elements of the earth's surface at a variety of spatial scales, and how they change through time.

Landscape ecology principles serve decision-makers and help resolve pressing issues in conservation, planning, design, development, and management of land.

Course Objectives:

This course is intended to provide students -

1. familiarity with the fundamental principles of landscape ecology and ways it is used for landscape conservation, planning, design, development, and management;
2. an understanding of contemporary conservation, planning, and design issues that can be addressed through the application of landscape ecology principles;
3. experience in developing techniques of visual communication for conservation, planning, and design audiences concerned with ecological integrity in highly valued landscapes;
4. experience synthesizing and applying landscape ecology to selected contemporary problems.

Textbook:

Turner, Monica G., Robert Gardner, and Robert O'Neill, 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

Other Key Sources:

Dramstad, W., J. Olson, R. T. T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

Forman, R. T. T. 1995. Land Mosaics: The Ecology of Landscapes & Regions. Cambridge University Press, NY.

CSU Catalogue Course Description:

+LAND 444 03(3-0-0). Ecology of Landscapes. F. Prerequisite: LAND 360; one course in biology. Theories, methods, and practices for interpreting, describing, and representing natural and human modified landscapes. (\$)

Course Grades:

Project 1	15%
Project 2	20%
Project 3	25%
Group Project	30%
Participation, Respectfulness, and Professionalism	<u>10%</u>
Total	100%

Each assignment will be evaluated and receive a grade:

- A** Distinctive professional school quality (90%-100%)
- B** Distinctive professional school quality with minor revisions (80%-89%)
- C** Distinctive professional school quality with moderate revisions (70%-79%)
- D** Distinctive professional school quality with major revisions (60%-69%)
- F** Incomprehensible or without redeeming qualities (below 60%)

Letter grades will be granted based on the relative professional quality of the work completed as of the specified due dates. Grades will be assigned based on the instructor's professional judgment, which shall be final, but may be appealed as described in the current CSU General Catalog under "Academic Appeals." If a student does not submit an assignment when it is due, the project letter grade will be reduced by two levels (A=C, B=D, C=F). Grades of "incomplete" are available only in the event of demonstrated life-threatening health or family emergency and will be handled on a case-by-case basis.

Readings:

24 Aug Intro to course & requirements

Syllabus

Forman, R.T.T., "Ecologically Sustainable Landscapes: The Role of Spatial Configuration," pp. 191-280, in: Zonneveld, I.S., and Forman, R.T.T., eds. 1990. Changing Landscapes: An Ecological Perspective. Springer-Verlag, New York, NY, USA.

26 Aug Landscape & Issues Defined

Jackson, John Brinckerhoff and H.L. Horowitz, ed. 1997. The Word Itself, pp. 299-306, By Way of Conclusion - How to Study the Landscape, pp. 307-318, in: Landscape In Sight. Yale University Press, New Haven, CT, USA.

Gorham, Eville. "Human Impacts on Ecosystems and Landscapes," pp. 15-32, in: Nassauer, J., 1997. Placing Nature and Landscape Ecology. Island Press, Washington, D.C., USA.

"Foreward," "Preface," "Chapter 1 - Foundations," pp. xiii-40, in: Forman, R.T.T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK.

"Chapter 1 - Intro to Landscape Ecology" pp. 1-23, in: Turner, Monica G., Robert Gardner, and Robert O'Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

31 Aug Landscape Meaning & Attitudes I

Berger, John. 1980. "Field," pp. 192-198 in: About Looking. Pantheon/Random House, New York NY, USA.

Carter, Forrest. 1976. "The Way," pp. 6-11, in: The Education of Little Tree. UNM Press, Albuquerque, NM USA.

Tuan, Yi-Fu. 1977. Chapter 2, "Experiential Perspective," in: Space and Place: The Perspective of Experience. UMin Press, Minneapolis, MN USA.

2 Sep Landscape Meaning & Attitudes II

Bortoft, Henri. 1996. "Part I - Authentic and Counterfeit Wholes," in: The Wholeness of Nature: Goethe's Way toward a Science of Conscious Participation in Nature, pp. 3-26. Lindisfarne Press, Hudson, NY USA.

Devall, Bill, and George Sessions. 1985. Chapter 5, "Deep Ecology," and Chapter 6, "Some Sources of the Deep Ecology Perspective." Deep Ecology. Peregrine Smith, Layton UT, USA.

7 Sep Holiday - NO CLASS

9 Sep Abiotic Causes of Landscape Pattern I

"Chapter 4, Causes of Landscape Pattern," pp. 71-83, in: Turner, Monica G., Robert Gardner, and Robert O'Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

Watts, May Theilgard. 1957. "Prairie Plowing Match, or, The Making and Breaking of the Tallgrass Sod," pp. 96-132, and, "Running Away from Spring, or, From Plains to Timberline in the Rockies," pp. 233-249, in: Reading the Landscape of America: An Adventure in Ecology. Nature Study Guild Publishers Reprint 1999, Rochester, NY, USA.

14 Sep Abiotic Causes of Landscape Pattern II / Project I Due

Forman, R.T.T. and M. Godron. 1986. Chapter 7 - "Natural Process in Landscape Development," pp. 229-271 in: Landscape Ecology. John Wiley and Sons, Inc., New York, NY, USA.

Way, Douglas S. 1978. Chapter 2, "Landforms and Aerial Photographic Terrain Analysis," pp. 31-58. Terrain Analysis. Dowden, Hutchison, and Ross, Stroudsburg, PA USA.

16 Sep Proposal Writing Workshop

21 Sep Local Field Trip I - TBD

Riegner, Mark. "Toward a Holistic Understanding of Place: Reading a Landscape Through its Flora and Fauna," pp. 181-215, in: Seamon, D., ed., 1993. Dwelling, Seeing, and Designing: Toward a Phenomenological Ecology. SUNY Press, Albany, NY, USA.

23 Sep Biotic Causes of Landscape Patterns I / Group Project Proposals Due

“Chapter 4, Causes of Landscape Pattern,” pp. 83-92, in: Turner, Monica G., Robert Gardner, and Robert O’Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

(Light) Delcourt, H.R. and Delcourt, P. 1991. Chapter 2, “Dispersal, Invasion, Expansion, and Migrational Strategies of Populations,” pp. 21-60, in: Quaternary Ecology. Chapman and Hall, New York, NY, USA.

28 Sep JSL out - Conway School Visit - NO CLASS

Catch up on readings and projects

30 Sep JSL out - GSD Alumni Council Meeting - NO CLASS

Catch up on readings and projects

5 Oct Biotic Causes of Landscape Patterns II / Project II Due

“Chapter 8, Organisms and Landscape Pattern,” pp. 201-247, in: Turner, Monica G., Robert Gardner, and Robert O’Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

(Light) Forman, R.T.T. and M. Godron. 1986. Chapter 8 - “The Human Role in Landscape Development,” pp. 273-311, in: Landscape Ecology. John Wiley and Sons, Inc., New York, NY, USA.

(Optional) Swanson, F., Franklin, J., Sedell, J.R., Chapter 11, “Landscape Patterns, Disturbance, and Management in the Pacific Northwest,” pp. 191-213, in: Zonneveld, I.S., and Forman, R.T.T., eds. 1990. Changing Landscapes: An Ecological Perspective. Springer-Verlag, New York, NY, USA.

7 Oct Group Project Proposal Advising / Drawing for presentation dates

12 Oct Proposal Presentations (5 Min. Presentations)

14 Oct Scale

“Chapter 2, The Critical Concept of Scale,” pp. 25-45, in: Turner, Monica G., Robert Gardner, and Robert O’Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

19 Oct Group Project Advising

21 Oct Patches

“Foreword,” “Preface and Acknowledgements,” “Foundations,” “Patches,” pp. 5-26, in: Dramstad, W., J. Olson, R. T.T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

(Optional-but not on reserve) “Part II - Patches,” pp. 41-142, in: Forman, R.T.T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK.

26 Oct Local Field Trip II - TBD

“The Land Ethic,” pp. 201-226, in: Leopold, Aldo. 1949. A Sand County Almanac and Sketches Here and There. Oxford University Press, Oxford, UK.

28 Oct Corridors

“Corridors and Connectivity,” pp. 35-40, in: Dramstad, W., J. Olson, R. T. T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

(Optional-but not on reserve) “Part III - Corridors,” pp. 143-282, in: Forman, R. T. T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK.

2 Nov Edges

“Edges and Boundaries,” pp. 27-34, in: Dramstad, W., J. Olson, R. T. T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

4 Nov Mosaics

“Mosaics,” pp. 41-46, in: Dramstad, W., J. Olson, R. T. T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

“Part IV - Mosaics and Flows,” (Chapters 12, 13, 14) pp. 283-402, in: Forman, R. T. T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK.

9 Nov Disturbance & Change in Mosaics I

“Chapter 7, Landscape Disturbance Dynamics,” pp. 25-45, in: Turner, Monica G., Robert Gardner, and Robert O’Neill. 2001. Landscape Ecology in Theory and Practice: Pattern and Process. Springer-Verlag, New York.

11 Nov Disturbance & Change in Mosaics II

“Part V - Changing Mosaics,” pp. 403-524, in: Forman, R. T. T. 1995. Land Mosaics: The Ecology of Landscapes and Regions. Cambridge University Press, Cambridge, UK.

16 Nov Spatial Harmonies In Nature and Design / Project III Due

“Introduction,” “I. Symmetry: Its Static and Dynamic Aspects,” “II. The Dynamic Series of Shapes,” “III. Dynamic Symmetry and the Law of Phyllotaxis,” in: Hambidge, J. 1932. Practical Applications of Dynamic Symmetry. Devin-Adair Co., New York, NY, USA.

18 Nov Case Study

“Part Two - Practical Applications,” “Summary and Conclusion,” pp. 47-70, in: Dramstad, W., J. Olson, R. T. T. Forman. 1996. Landscape Ecology Principles in Landscape Architecture and Land Use Planning. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.

23 Nov Recess - NO CLASS
25 Nov Recess - NO CLASS

30 Nov Group Project Boards Due / Group Presentations
2 Dec Group Presentations

7 Dec Group Presentations
9 Dec Group Presentations

Projects:

PROJECT 1 - Landscape Interpretation and Meaning

PROJECT 2 - Landscape Pattern Causes and Descriptions

PROJECT 3 - Characterizing and Representing Landscape Structure and Function

GROUP PROJECT - Landscape Ecological Conservation and Development Plan

Course Meeting Agenda:

Week	MON	WED
1	24 Aug Intro to course & requirements	26 Aug Landscape & Issues Defined
2	31 Aug Landscape Meaning & Attitudes I	2 Sep Landscape Meaning & Attitudes II
3	7 Sep Holiday - NO CLASS	9 Sep Abiotic Causes of Landscape Patterns I
4	14 Sep Abiotic Causes of Landscape Patterns II /	16 Sep Proposal Writing Workshop
	Project I Due	
5	21 Sep Local Field Trip I	23 Sep Biotic Causes of Landscape Pattern I /
		Group Project Proposals Due
6	28 Sep Conway School Visit - NO CLASS	30 Sep GSD Alumni Council Meeting - NO CLASS
7	5 Oct Biotic Causes of Landscape Pattern II /	7 Oct Group Project Proposal Advising /
	Project II Due	Drawing for presentation dates
8	12 Oct Proposal Presentations (5 Min. Presentations)	14 Oct Scale
9	19 Oct Group Project Advising	21 Oct Patches
10	26 Oct Local Field Trip II	28 Oct Corridors
11	2 Nov Edges	4 Nov Mosaics
12	9 Nov Disturbance & Change in Mosaics I	11 Nov Disturbance & Change in Mosaics II
13	16 Nov Growth Symmetry & Dynamics /	18 Nov Case Study
	Project III Due	
14	23 Nov Recess - NO CLASS	25 Nov Recess - NO CLASS
15	30 Nov Group Project Boards Due /	2 Dec Group Presentations
	Group Presentations	
16	7 Dec Group Presentations	9 Dec Group Presentations
17	14 Dec - Monday: 11:20a-1:20p (2 hours) is the time reserved for a final in this course.	

Recommended Readings:

- Abrams, David. 1997. *The Spell of the Sensuous: Perception and Language in a More-than-Human World*.
- Berry, Wendell. 2000. *Life Is a Miracle*. Counterpoint, Washington, D.C.
- Benedict, Audrey. 1991. *A Sierra Club Naturalist's Guide: The Southern Rockies*. Sierra Club Books, San Francisco.
- Bradshaw, A. D. 1986. "Ecological principles in landscape." In *Ecology and Design in Landscape*, eds. Bradshaw, A.D., Goode, D.A., and Thorpe, E. pp. 15-35. The 24th Symposium of the British Ecological Society. Blackwell Scientific, London.
- Delcourt, H.R. and Delcourt, P. 1991. *Quaternary Ecology*. Chapman and Hall, New York, NY, USA.
- Dramstad, W., J. Olson, R.T.T. Forman. 1996. *Landscape Ecology Principles in Landscape Architecture and Land Use Planning*. American Society of Landscape Architects / Harvard University Graduate School of Design / Island Press, Washington, DC.
- Eiseley, Loren C. 1959. *The Immense Journey*. Vintage Books, Random House, New York, NY. pp. 79-94, "The Real Secret of Piltown."
- Forman, R.T.T. 1995. *Land Mosaics: The Ecology of Landscapes and Regions*. Cambridge University Press, Cambridge, UK.
- Forman, R.T.T. and M. Godron. 1986. *Landscape Ecology*. John Wiley and Sons, Inc., New York, NY, USA.
- Forman, R.T.T. 2008. *Urban Regions*. Cambridge University Press, Cambridge, UK.
- Goldstein, T. 1995. *Dawn Of Modern Science: From The Ancient Greeks To The Renaissance*. Da Capo Press, Cambridge, MA, USA. pp. 65-186.
- Grime, J.P. 1986. "Manipulation of plant species and communities." In *Ecology and Design in Landscape*, eds. Bradshaw, A.D., Goode, D.A., and Thorpe, E. pp. 175-194. The 24th Symposium of the British Ecological Society. Blackwell Scientific, London.
- Hellmund, Paul Cawood, Smith, Daniel, and Smith, Daniel (Editor). 2006. *Designing Greenways: Sustainable Landscapes for Nature and People*. Island Press, Washington, DC.
- Krebs, Charles J. 2008. *Ecology: The Experimental Analysis of Distribution and Abundance* (6th edition). Benjamin-Cummings, Central Park, Rugby, Warwickshire, UK.
- Kuhn, T.S. 1962. *The Structure of Scientific Revolutions*. University of Chicago Press, Chicago, IL, USA. pp. 1-9; 160-173.
- Leopold, Aldo. 1949. *A Sand County Almanac and Sketches Here and There*. Oxford University Press, Oxford, UK. (More recent update available).
- Lobeck, A.K., 1939. *Geomorphology: An Introduction to the Study of Landscapes*. McGraw-Hill, New York, NY, USA. (or current edition).

- Mayr, Ernst. 1982. The Growth of Biological Thought: Diversity, Evolution, and Inheritance. Belknap Press, Cambridge, MA, USA. pp. 83-146.
- Meinig, D.W., JB Jackson, eds. 1979. The Interpretation of Ordinary Landscapes. Oxford University Press, New York, NY, USA.
- Nash, Roderick. 2001. Wilderness and the American Mind. Yale University Press, New Haven, CT, USA. Chapters 1, 2, 11, 13.
- Nassauer, J., 1997. Placing Nature and Landscape Ecology. Island Press, Washington, D.C., USA.
- Noss, Reed F., and Cooperrider, Allen Y. 1994. Saving Nature's Legacy : Protecting and Restoring Biodiversity. Island Press, Washington, D.C., USA.
- Rolston, Holmes. 1989. Philosophy Gone Wild: Environmental Ethics. Prometheus Books, Buffalo, NY, USA. Chapters 1, 5 (2, 3, 4, 7, 8 suggested).
- Strahler, Alan, and Arthur Strahler. 1992. Modern Physical Geography, 4th Edition. Wiley & Sons, New York, NY, USA.
- Tuan, Yi-Fu. 1974. Topophilia: A Study of Environmental Perception, Attitudes, and Values. Prentice-Hall, New York, NY, USA.
- Turner, M.G., R. H. Gardner and R.V. O'Neill, R.V. 2001. Landscape Ecology in Theory and Practice. Springer-Verlag, New York, NY, USA.
- Udall, Stewart. 1963. The Quiet Crisis. Holt Rinehart and Winston, New York, NY, USA. Chapters 1, 2, 5, 6, 10, 12.
- White, Jr., Lynn. "The historical roots of our ecologic crisis." Science, V. 155 (Number 3767), March 10, 1967, pp 1203–1207
- Wu, J. and R. Hobbs (Eds). 2007. Key Topics in Landscape Ecology. Cambridge University Press, Cambridge.
- Zonneveld, I.S., and Forman, R.T.T., eds. 1990. Changing Landscapes: An Ecological Perspective. Springer-Verlag, New York, NY, USA.