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# Proceedings

# Land Type Associations Conference: Development and Use in Natural Resources Management, Planning and Research

**April 24 – 26, 2001**
**University of Wisconsin**
**Madison, Wisconsin**

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Marie-Louise Smith

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## III. Posters, Map Gallery, & Interactive Exhibit Abstracts

### Posters



### Map Gallery Abstracts

# Land Type Associations Conference: Summary Comments

*Thomas R. Crow*[1]

## Introduction

Holding a conference on Landtype Associations in Madison seems appropriate given the amount of research and application on ecological classification that has taken place here and elsewhere within the region. In fact, a previous conference held at the University of Wisconsin, Madison, in March 1984 on ecosystem classification entitled "Forest Land Classifications: Experiences, Problems, Perspectives" provides a useful framework for summarizing the current meeting and, more specifically, a benchmark for assessing the advances in the development and application of ecosystem classification.

In the proceedings of the 1984 conference, Bailey presents six problems related to ecosystem classification and mapping that needed resolution in order to successfully implement a classification system. I think it is worthwhile revisiting these problems in light of what we heard at the current conference on Landtype Associations. Are these problems still relevant or have we moved beyond what was perceived by Bailey in 1984 as major impediments to implementing ecosystem classification?

## Problems of Terminology and Criteria for Recognition

According to Bailey (1984), there is not a universally shared understanding of terms such as "ecological land unit" and "ecosystem." As a result, ecosystem classification is not being applied uniformly across the landscape, nor are same criteria being used in development and application, and the basic concepts underlying land classification can vary substantially.

The keynote speaker for the Landtype Associations, Burton Barnes, addressed these problems. There will always be those who view ecosystems as abstractions that are defined only by the interactions among their components and therefore difficult to identify in reality. The take-home message from Barnes, however, is that ecosystems are in fact tangible, identifiable, volumes of air, land, water, and vegetation. Following the lead of Rowe (1992), "landscape ecosystems" are described as real geographic chunks of the earth's skin. The concept of a hierarchical, multiple-factor framework for distinguishing, regionalizing, classifying, and mapping landscape ecosystems is gaining the day. We saw many examples of this at the conference. Sure there were some differences, and there will always will be, but there were many fundamental similarities in the conceptual basis among the classifications presented at this conference.

The work of Barnes and his students on the Huron Mountain Club, the Sylvania Wilderness, the McCormick Experimental Forest, and the University of Michigan's Biological Station has been invaluable in illustrating the process of identifying and characterizing landscape ecosystems. This work was extended to larger scales when Albert et al. (1986) published a classification and map of regional ecosystems of Michigan and Albert (1995) did the same for the three Lake States. The evidence is overwhelming – ecosystems can be identified and characterized at many different spatial scales.

## What Role Should Land Use Play in Delineating Units?

This problem relates to the use of relatively permanent characteristics such as soil, landform, and climate, as the basis for delineating regional and landscape ecosystems as opposed to using existing vegetation to characterize the extent of units assuming that existing vegetation better reflects land use.

The role of land use in delineating regional and landscape ecosystem was not an issue at the Land Type Association Conference. In fact, land type associations provide a useful tool for considering land use. For example, Devon Nelson demonstrated the utility of land type associations as the basis for land use planning in Weber County, Utah. Steve Fay illustrated the use of land type associations for forest planning on the White Mountain National Forest in New Hampshire. And Dan Devlin showed us the use of landforms in managing landscapes on Pennsylvania's State Forests. The point here is that land use is not an independent variable used to define landscape ecosystems, but it can be a dependent variable in which land use patterns are related to landscape ecosystems as defined by their climate, landform, soil, and vegetation. Clearly, we need more demonstrations that illustrate the use of ecosystem classification in addressing important environmental and social issues such as those related to land use.

## Insufficient Knowledge of Ecological Processes Limits Our Ability to Make Robust Environment Predictions

The basic argument here is that our knowledge of ecological processes for most ecosystems is insufficient to allow reliable predictions of ecosystem responses to

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management actions (Bailey 1984). This statement is probably as valid now as it was in 1984. But how does this statement relate to ecosystem classification? Does this lack of knowledge preclude identifying and characterizing ecosystems? I think not. There will always be more to learn about ecological processes, but again, I consider ecosystem classification to be a useful tool — in this case a research tool – that can be helpful in studying ecological processes. Specifically, it provides a basis for stratifying landscapes into similar ecosystems so that differences among systems can be reduced when studying processes.

This point was perhaps best demonstrated in Dave Cleland's paper in which Subsections and Landtype Associations were used as the basis for mapping natural disturbance regimes in the Lake States and in Gary Drotts' and Jodie Provost's presentation in which species ranges and habitat relationships were defined for selected wildlife species within the framework provided by Subsections and Landtype Associations. The application of multi-factor, integrated, hierarchical ecosystem classifications for the purpose of studying ecological processes such as nutrient cycling, forest dynamics, and forest growth is a largely untapped but potentially useful area of application. It is just a matter of time, for example, before modelers use Subsections or Landtype Associations as a framework to parameterize forest growth models. It seems so intuitive; I am surprised that it has not been done already.

## Existing Classifications Systems Usually Emphasize the Terrestrial System

This is as much problem in 2001 as it was in 1984. According to Bailey (1984), most land classifiers do not understand aquatic systems and most aquatic classifiers to not understand terrestrial systems. Amen to this statement. We have the aquatic camp and the terrestrial camp – each doing their own thing and waiting for the other camp to come around. As we all recognize, aquatic and terrestrial systems are closely linked and approaches to classifying ecosystems should be capable of recognizing the integrated nature of terrestrial and aquatic ecosystems.

A few small steps have been taken in linking terrestrial and aquatic systems through classification (e.g., Baker et al. 1998, Crow et al. 2000), but more effort in this area is warranted.

## The Problem of Wildlife

Although ecosystem classification is presented as a means for integrating both physical and biological factors existing in the landscape, integrating wildlife into the classification process has proven difficult (Bailey 1984). This may be true when considering the factors using to recognize and delineate units, but it is not true when considering the application of ecosystem classification. At this Conference, we heard about the application of Landtype Associations for ranking the quality of Indiana Bat habitat (Tom Demeo) on the Monongahela National Forest in West Virginia, for evaluating habitat of the Kirtland's Warbler in Michigan (Burt Barnes), and as a tool for wildlife management in Minnesota (Gary Drotts and Jodie Provost).

Abundant examples exist of applying ecosystem classification to wildlife questions. Integrating wildlife into the classification process may still be a problem, but as an applications tool, ecosystem classification has many uses in wildlife management.

## The Relationship Between Delineated Units is Difficult to Assess

Much progress has been made in understanding relationships between landscape ecosystems during the past 20 years. This work has included the movement of organisms through landscapes, the flow of water and water borne materials, the fluxes of carbon and nitrogen between landscape ecosystems, the dispersion of seeds and other propagules among ecosystems, as well as the long distant transport of pollutants such as ozone in the lower atmosphere. The importance of context, adjacency, and proximity when considering ecological processes and characterizing the composition of a landscape ecosystem is now widely recognized. Much of this progress has been accomplished as part of the emerging discipline called landscape ecology (Pickett and Cadenasso 1995).

At the beginning of this Conference, you were encouraged to both communicate and demonstrate the utility of Landtype Associations. Is it not enough to simply classify, and as a tool, the classification is only a beginning. As was pointed out, your work is in the vanguard of applied ecology, but the linkages between ecosystem classification, critical natural resource issues, and decision-making are not obvious to most managers, planners, and policymakers. Not only do you have the responsibility for developing the classification, you are also responsible for demonstrating its value to help solve critical natural resource problems that are important to the public. Until this is done, your job is unfinished.

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