Essays of a Peripheral Mind

Art and Science

By K. M. Havstad

This is an essay about 2 illustrations. They are remarkably similar, though they have remarkable differences. Both are artistic, yet both are based in science. Both convey powerful ideas, and both justify thoughtful study. For each, a passing glance would not do justice. Both have tremendous utility in explaining human interactions with our environments. Both are intensely creative and may raise more questions in their interpretations than they answer. Both are reflections of our world. Both are useful in our pursuits.

Despite these similarities, the differences are equally striking. The first of these illustrations, in its original form, is nearly priceless (estimates of its value at auction approach $100 million if it was even available) and would require a trip to the Art Institute of Chicago to view it as painted. It is the product of one mind. Its linkage to rangelands would seem remote, but its core concepts are easily communicated. The second illustration is freely available in its present form on the Internet. It is a work in progress and the product of many minds. Its linkages to rangelands are obvious, but its nuances are not easily grasped.

The first illustration is *Nighthawks*, a painting by Edward Hopper, one of the great American painters of the 20th century (Figure 1). Painted in 1942, *Nighthawks* is maybe Hopper's most celebrated piece and familiar to most college graduates with an elective in Art Appreciation 101. Although my favorite Hopper painting is one of his last works, *People in the Sun* (1960), which distinctly captures my profession and the people I work with, *Nighthawks* is also an insightful, many-layered work of art. At first glance it portrays a view

Figure 1. Edward Hopper, American, 1882–1967, Nighthawks, 1942, Oil on canvas, 84.1 × 152.4 cm, Friends of American Art Collection, 1942.51 The Art Institute of Chicago. Photography © The Art Institute of Chicago.

of urban life as America emerged from the Depression and into the throes of World War II. The diner scene is instantly recognizable. Yet a deeper biological expression of human nature is readily evident. The seated adults are obviously presented as birds of prey perched above a single object of prey in white. The males are drab and similar in appearance, while the lone female is brightly colored. The single male perched to the left seems to be more interested in the female of his species than in the prey. All these humans are drawn to light from their dark cave like dwellings apparent in the fringes of the piece. Hopper communicates other ideas about human nature, such as our extraction from our more wild origins into artificial dwellings and our inherent gregariousness but also

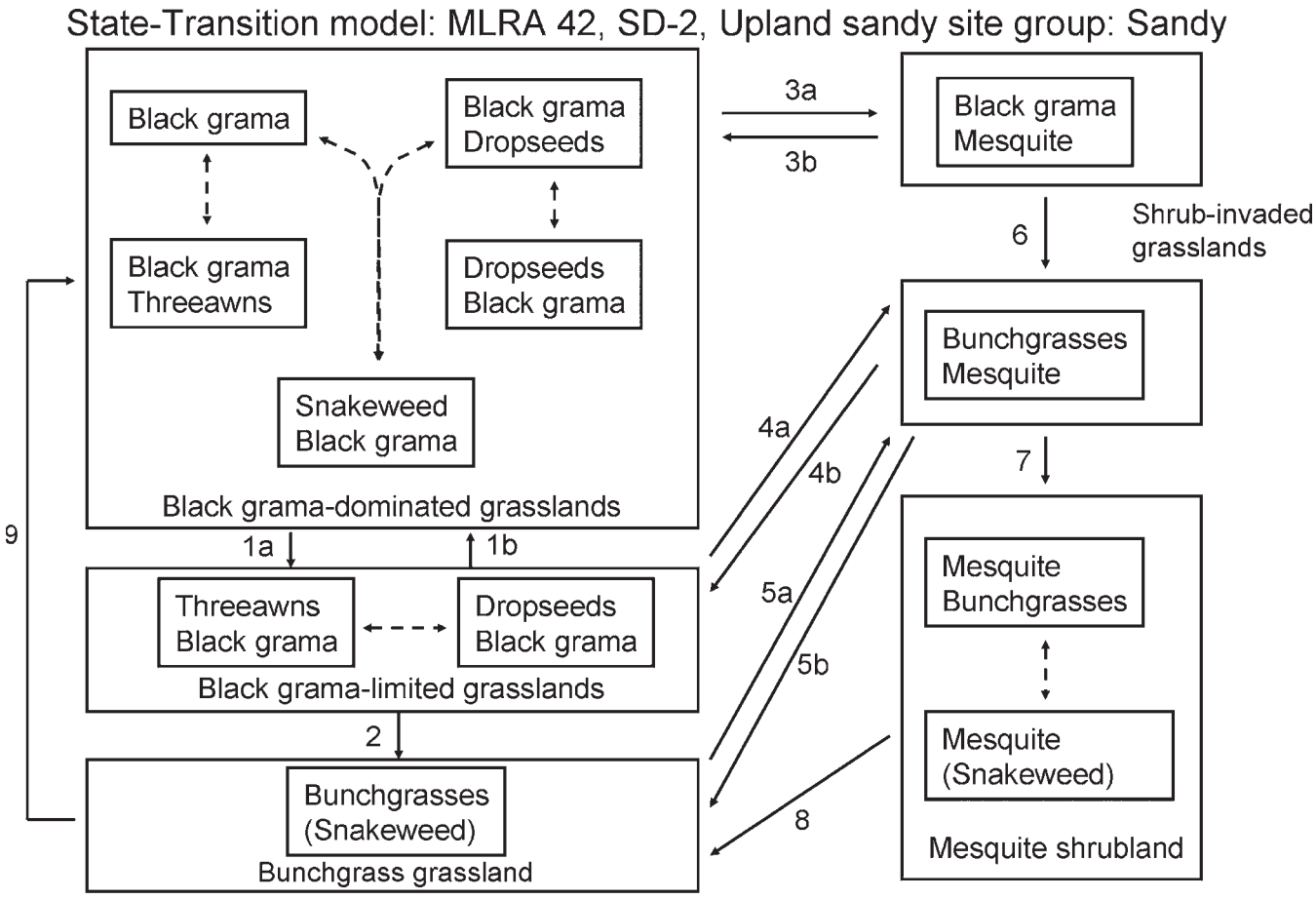

Figure 2. State and transition model taken from the Natural Resource Conservation Service's Ecological Site Description for a Sandy Upland site in Major Land Resource Area (MLRA) 42, Southern Desert (SD) region 2 viewable at http://esis.sc.egov.usda.gov/esis_report/fsReport.aspx?id=R042XB012NM&rptLevel=all.

our continued independent, almost lonely nature. All these artistically expressed ideas are rooted in principles of human biology or Hopper's interpretations of human biology and enrich my perceptions of our interactions with our environment. One of the attributes of Hopper's art is its ability to accommodate personal (okay, amateur) interpretations.

It was over 30 years ago that I first heard the profession of range management defined as both art and science. This statement was presented in an introductory range class at a university and was something I gave little thought to at the time. It seemed to be an expression that captured the idea that the science wasn't perfect and that rangelands were so heterogeneous that it took creativity to apply any management principle or practice. Or it was a statement that justified a general approach of trial and error. It was a license to guess. Although many currently accessible glossaries with definitions of rangeland management no longer include the "art and science" reference, the description is still prevalent in commonly referenced textbooks. In addition, current definitions may lack this "art and science" term yet still refer to a human element and that management implies choices and interpretations. Art is, by definition, a human contrivance. As I've thought more recently about the current technologies emerging from our profession—and, specifically, ecological site descriptions, their utilities, their limitations, and their creation—I admit that everything we do is an interpretation of our views on nature. Our applications of principles require an artistic view of the scientific basis beneath those principles. I see it as the visual power of a *Nighthawks* needing to be merged with the inferences drawn from our recorded observations.

This brings us to the second illustration. This is a description of vegetation dynamics, a state and transition (S&T) model, characteristic of sandy soils in the 8–12-inch pre-

cipitation zone of the desert region of southern New Mexico (Fig. 2). Illustrations such as this one are embedded in ecological site descriptions now being revised by rangeland professionals working with users, including ranchers, as well as the science community and other interested parties. They represent a core technology within the profession. They reflect much of the science that has occurred on rangelands throughout the world over the past century. Illustrations such as Figure 2 convey many of our basic principles of both ecology and management. Yet, like *Nighthawks*, this illustration is definitely art.

It is a contrivance. It is an interpretation or, in fact, a compilation of many interpretations. As an image, it serves to communicate ideas about rangelands, how they vary through time, how they respond to management, their resilience, and their resistance. It is modern art as a record of our observations.

Is Figure 2 too complex for use in rangeland management? I think not. It can be reduced to a fairly simple layer that illustrates different possible plant communities. Further complexity can be added by the viewer depending on interest or purpose. And it can create further questions for study or be refined at a later date with new information. In this fashion, the S&T model is like a more classic work of art such as *Nighthawks*. It can be viewed simply as a wonderful presentation of something from our past, or it can be studied for more nuanced and intricate patterns of nature viewed today or of what is possible in the future. Two key points about Figure 2 are that 1) it does represent both the art and science of our profession and that 2) it is a better illustration than we have had before. Some may prefer the earlier illustrations of rangelands that we have used in the past. I find them less interesting, less insightful, and less open to new information. They are less art and less science than what is available to us today. Our professional advancements are really about updating our slivered substitutions of science for art. There has always been an appreciation for both.

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