Introduction: The Natural History of Agricultural Landscapes

Gary Kleppel

During the past 10 millennia, agriculture has evolved from a tentative “conversation with nature” to a series of exact sciences that have changed our species’ relationship with the natural world. The ability to produce food in large quantities at a single location has been transformative for our species and for the majority of ecosystems on Earth. It has provided an alternative to hunting and gathering, and permitted the emergence of settlements, cities, and civilizations. It has allowed for the division of labor and contributed to the exponential expansion of human population, both in terms of numbers of individuals and geographic range. Simultaneously, agriculture has had and continues to have devastating impacts on natural systems and processes. As a primary contributor to the massive elimination of species and the millennia-long trend toward global deforestation, the loss of tens of billions of tons of soil annually, the contamination of the atmosphere with climate-altering chemicals, and the pollution of lakes, rivers, and coastal marine waters, agriculture is as much a scourge to our life-support system as it is an essential element of that system (see for reviews, Shortley and Abler 2001). As we approach the Earth’s carrying capacity for our species, we will need to produce ever more food, until, potentially, the ability to meet global food demand collapses under the weight of 9–10 billion people in the middle of this century (FAO 2009, Tilman et al. 2011). The transformation of our food system to one that is more efficient and sustainable than it is currently requires input not only from the agricultural community but from a diversity of disciplines. Natural historians will contribute substantively to that conversation, and the Northeast may be a bellwether for the emergence of a regenerative agriculture that simultaneously nurtures us and the ecosystems to which we belong.

The agricultural landscape matrix of the northeastern United States (here considered New York and New England) emerged from the practices of small-holder European farmers of the 17th century. It has adapted over 4 centuries to the region’s climate, topography, developing technologies, and cultures. While pre-Colombian natives cleared land for maize-based agriculture, and burned some of the region’s extensive forests to drive game, nearly 50% of the forests in the Northeast were cleared by European immigrants and their progeny between the 17th and 19th centuries (Thompson et al. 2013). Most of that land was repurposed for food and fiber production. As agriculture transitioned westward during the 19th and 20th centuries, much of the farmland in New York and New England that had not been merged into large parcels as dictated by the emerging industrial model of agriculture, was abandoned or sold for development. Between 1900 and 1997, the amount of farmland in the Northeast declined by more than 73% (Fig. 1). This trend appears to have

*Department of Biology, University at Albany, SUNY, Albany, NY 12222; gkleppel@albany.edu.