Supplementary Materials

1. Environmental Trade-offs Associated with Agriculture

The current movement toward local and regional food hubs stands in marked contrast to the more centralized production practices that dominated U.S. agriculture for the last 70 years. The historic concentration of food production in only a few regions of the U.S. has led to serious environmental and social concerns related to the contribution of agriculture to climate change, degradation of ecosystem services, and the security of the U.S. food supply [1].

But whatever its specific form (*i.e.*, centralized or decentralized, more or less intensive, *etc*.), all commercial agriculture is characterized by three main activities: (1) inputs of energy, nutrients, and water; (2) production and harvest of resources, exported and consumed off-farm; and (3) varying levels of disturbance to on-farm and connected ecosystems. While the former two activities determine the profitability of an agricultural enterprise within a given market context, all three define the environmental impact of a given agricultural production system within a given landscape. By its very nature, agricultural land use necessarily disturbs, to varying degrees, vital regulating, provisioning, and supporting ecosystem services [2] in exchange for altered food provisioning services. In terms of non-food-provisioning ecosystem service impacts, then, what distinguishes agricultural practices from one another is the nature and spatiotemporal extent of those disturbances.

2. The Re-expansion of New England Agriculture

As recently as the mid-1800s, over 50% of the land area in some New England states was in non-forest agricultural production [3]. As agriculture moved west over the following decades, much of the cleared land reverted back to forest. Currently the region is dominated by forest rather than agricultural fields, which make up only 7% of the land area [4]. Now the region is experiencing a re-expansion of agriculture, with 6623 farms added from 2002 to 2012, an increase of 23% [5]. Additionally, 28% of New England farms sell directly to consumers, compared to less than 7% for the entire U.S.; and New England states now also rank in the top 10 in the nation for direct market sales as a percentage of total farm sales, percent of all farms with direct sales, and average direct market sales per farm [5]. This re-emerging local farming industry is having an important impact on the region's economy [46]. The trend toward increasing agricultural production in the region is further illustrated by the fact that diverse groups (e.g., Food Solutions of New England, Green Start NH, Maine Organic Farmers and Gardener's Association, University Extension services) are advocating for greater agricultural self-sufficiency. A prime example is the situation considered by Food Solutions of New England of producing 50% of the calories consumed in New England by 2060 [7].

3. Types of Agricultural Land Use Change in New England

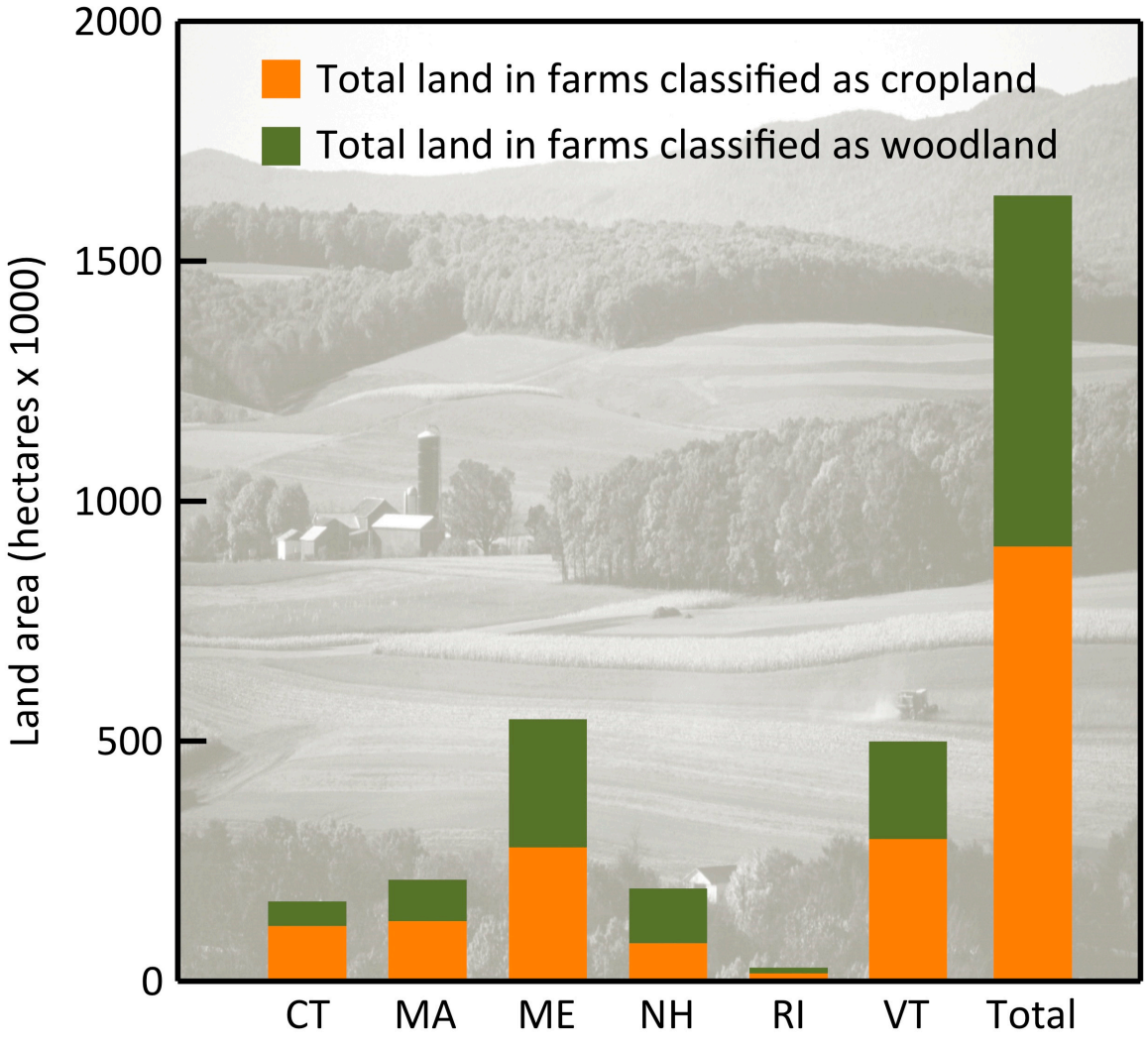
The re-expansion of agriculture in New England is leading to several broad categories of agricultural land use change (Supplementary Figure S1). While these changes may facilitate a desired increase in food production, each is also associated with potentially important ecosystem service trade-offs at local, regional, and potentially larger scales [8].

Figure S1. Examples of agricultural land-use changes occurring in the Northeast US (**a**) extensification via a newly established farm in what had previously been second-growth forest (see inset photos); (**b**) extensification via silvopastural livestock production within a managed forest stand; (**c**) intensification via tomato production in season-extending high tunnels; and (**d**) reclamation via a new community garden that replaces an empty urban lot following site preparation (see inset photos).

3.1. Extensification: Reconversion of Forested Land to Agriculture

A high percentage of the land cover on most farms in the region is forested [5]. While the exact acreage of reforested land that has been reconverted to agricultural land uses in New England in recent years is unknown, the future potential for this type of conversion is vast, even if one considers only those forested lands already designated as farmland (Supplementary Figure S2). In some cases, forests abutting established agricultural fields are cleared to increase contiguous agricultural acreage. In other cases, forest stands are thinned in order to establish silvopasture systems that produce both livestock and forest products on the same parcel of land [9]. These types of forest conversions are further facilitated by policies aimed at assisting farmers in clearing forested land on their farms, such as a recently enacted state-level program in Connecticut which provides cost-sharing for woodlot clearing for agriculture [10].

Figure S2. Land area managed as farms in the six New England states: Connecticut (CT), Massachusetts (MA), Maine (ME), New Hampshire (NH), Rhode Island (RI), and Vermont (VT). Woodlands make up a substantial fraction of the total cover of most farms. Except for Rhode Island, data are from the 2012 USDA Census of Agriculture [5]; due to missing 2012 data, the data for Rhode Island are from 2007. Photo source: USDA-ARS Image Gallery [11].



3.2. Intensification: Changing Practices on Current Agricultural Land

Existing agricultural land is also changing. Such changes include conversion from pasture-based to cultivation-based agriculture (and vice versa); transitions from conventional to organic management practices; the adoption of growing season extension practices such as high tunnel, hoop house, or greenhouse production; and other forms of intensification, specialization, and diversification of production.

3.3. Reclamation: Conversion of the Built/Residential Environment to Agriculture

Many of the soils in New England classified as suitable for agricultural uses are located in areas that are also desirable for urban development. Changing suburban lawns into household gardens, vacant lots into urban farms or gardens, and roofs into container gardens are all examples of this diverse class of land use conversion.

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