

## Ecosystem Services help establish the value of turfgrass greenspaces (lawns!)

*By Michael R. Barnes, Ph.D.*

IF YOU WERE TO READ popular media articles and even some scientific articles about lawns/areas of turfgrass, you might come away with the impression that turfgrass has little ecological value (see Image 1). The common refrain is that turfgrass greenspaces require so many inputs (e.g., water, fertilizer) and maintenance that their benefits are overshadowed by the costs and that we should simply do away with them altogether.

However, like most things in life, things are not as black and white as they seem – in fact, there are many shades of gray, or perhaps in this case, green. Let me be clear from the outset, turfgrass greenspaces have significant ecological value when the question is framed appropriately.

### Ecosystem Services

Before I dive into specifically why this is the case, let's talk a bit about *ecosystem services*. Briefly, ecosystem services refer to a framework for categorizing the benefits that nature offers.

Developed as part of the [Millennium Ecosystem Assessment](#) (MEA) in 2001, more recent MEA iterations organize these benefits into three main categories: cultural, provisioning, and regulation and maintenance.



*Image 1. Screen capture of a presentation given at a national conference declaring that lawns have no ecological value. Capture by Michael R. Barnes*

**Cultural ecosystem services:** Non-consumptive outputs from ecosystems that affect mental and physical states of people (e.g., relaxation).

**Provisioning ecosystem services:** Energy and material outputs that can be biotic and abiotic (e.g., wild berries).

**Regulation and maintenance ecosystem services:** Abiotic and biotic mediation or moderation of environments that impact human health, comfort and/or safety (e.g., cooling).

Each category has a vast number of subcategories to enhance the specificity of benefits. This helps researchers better understand specific differences between landscape types (and, more broadly, ecosystems) and quantify more precisely the benefits of different forms of nature. Further, this formal framework also allows for comparisons to be made between different

landscape options. Crucially, this is where we run into the main issue underlying the perception that turfgrass greenspaces have little ecological value. There are two separate factors here that need to be unpacked.

### **Comparing surface to surface**

First, turfgrass greenspaces are rarely compared to similar surface types. Often, especially in the popular media, turfgrass areas are compared to landscapes that share very few, if any, characteristics in common – e.g., prairies or forests. Of course, there's nothing wrong with prairies and forests, but they aren't *similar to* a lawn in the uses and functions they afford. Meaning that you can't take a nap, play frisbee, or chase after your kids in a prairie (not easily...). No question that prairies have a higher level of biodiversity and provide far more provisioning types of ecosystem services than a turfgrass lawn – that's *their* strength. Similarly, a forest will provide substantially higher levels of cooling and CO<sub>2</sub> absorption – regulation and maintenance services – compared to a lawn, but that's what *trees* are good at.

When we look at the benefits turfgrass greenspaces offer, it's clear that they provide a comfortable ground cover that affords a variety of activities to take place on them. Therefore, let's get prairies and forests out of the picture, and focus instead on *turfgrass* alternatives like artificial turf and hardscape (e.g., concrete, asphalt). Now, if we compare the ecosystem services, what do we find? Natural turfgrass greenspaces contain far more ecosystem services than the alternatives, which provide at best minimal services and at worse far more *disservices* (properties or functions of landscapes perceived as nuisance, unwanted, or harmful).

A couple of examples illustrate the points above, starting with heat. Heat, especially in urban areas, is a growing concern as heat waves increase in both frequency and severity. One of the most effective ways to combat urban heat is with greenspace and vegetation. Turfgrass areas do indeed provide cooling (especially when irrigated properly). If you compare that to artificial turf or hardscapes, these surfaces not only don't provide cooling, but also, they can exacerbate heat effects close to the surface itself and more broadly.

Another example is related to carbon sequestration. When managed properly, and especially in the case of low-input turfgrasses (those that use less water, fertilizer, and herbicides), turfgrass areas *can* sequester CO<sub>2</sub>. Compare that to the alternatives, which have significant CO<sub>2</sub> emissions tied to their production and eventual disposal. A common misconception related to artificial turf specifically is that it doesn't require maintenance. This is false. Artificial turf surfaces require routine maintenance, although not in the traditional ways applied to natural turfgrass lawns. Overall, then, we can see that when comparing turfgrass greenspaces to surfaces that afford similar uses/functions, natural turfgrass provides a far greater number of ecosystem services.

## Valuing cultural ecosystem services

The second factor that plays a role in popular perception that turfgrass greenspaces have little ecological value is related to the smaller role that cultural ecosystem services have (until recently) played in the scientific literature and popular media. Among scientists in general, the view of the ecosystem services framework was largely from a natural-science perspective, meaning that the categories related to provisioning and regulation and maintenance services were discussed much more often, and in more detail, than cultural services. Turfgrass areas, although they provide a variety of other services, find their strength in the cultural ecosystem service category.

A part of my initial work in turfgrass research was to read a significant number of papers on the benefits of parks. Interestingly, while paper after paper described parks as places where people go to rest and recreate, very rarely did I ever see turfgrass mentioned. This seemed odd to me as the obvious question is: What surface are all these activities taking place on? The answer of course, in most cases, is turfgrass. Lawns, our primary focus here, are largely designed and maintained for a wide variety of human uses and functions. However, as with the comparison of surface types, the lack of discussion around the importance of cultural ecosystem services worked to the detriment of lawns.

### In praise of lawns

So, let's look at the ways that turfgrass greenspaces afford a variety of cultural ecosystem services. Lawns are excellent at providing a space for play, rest and relaxation, whether someone is looking for a comfortable place to take a nap, sunbathe, or just a place to sit and observe. These functions are especially important given that alternatives are often less comfortable (e.g., texture,



*Image 2. Individuals enjoying the cultural ecosystem services of a turfgrass greenspace in a variety of ways. Photo by Michael R. Barnes*

heat), or aren't as flexible (i.e., they only provide a single function). Additionally, turfgrass areas provide places for recreation and health-related behaviors to take place. This can be as informal as an individual exercising, and as formal as an organized sporting activity (croquet, anyone?), affording individuals the opportunity to engage in health-promoting activities. Finally, lawns

provide opportunities for socializing – whether intentionally, as in meeting up with friends and family for a picnic, or unintentionally as in joining a group of strangers for a game of frisbee in the park.

TURFGRASS GREENSPACES of all shapes and sizes do indeed have ecological value. Their strength lies in being a canvas, a foundation on which a wide variety of activities can take place to enhance human health and well-being while at the same time improving ecological health, especially when compared to alternatives that afford similar uses/functions.

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