



Florida Department of Transportation Research

Economic Impact of Ecosystem Services Provided by Ecologically Sustainable Roadside Right of Way Vegetation Management Practices

BDK75-977-74

The Florida Department of Transportation (FDOT) has approximately 186,121 acres of right-of-way (ROW) for roads in the State Highway System (SHS), about half of which are vegetated. As in many states, turfgrass is often used to stabilize soil, prevent erosion, and provide a clear recovery zone for vehicles that leave the highway. To meet these goals, roadside vegetation managers must maintain turf in a relatively healthy condition, a byproduct of which is aesthetic appeal. However, maintaining turfgrass results in a financial liability due to maintenance costs—\$38.5 million in 2011-12 alone, a third of which was mowing.

In this report, University of Florida researchers took a broader view of these 90,000+ acres of vegetation. By examining ecosystem benefits derived from these acres—called ecosystem services—researchers showed that the value of these lands is millions of dollars annually, and that with alternative management practices, costs can be reduced and ecosystem benefits increased.

On the value side, there are many methods for assigning value to ecosystem services, including market price, productivity, hedonic pricing, and others. Most methods required extensive data collection, including mapping, market and energy valuation, surveys of willingness to pay, public value perception, and more. Collecting this data was well beyond the project's scope, so the researchers chose the benefits transfer method, often used to estimate value of benefits by deriving them from existing studies. On the cost side, researchers examined and compiled FDOT maintenance cost records of both traditional turfgrass treatment and native wildflower treatment, including mowing, seeding, mulching, and other recurring activities.

Ecosystem services range from the practical to the esoteric, so researchers reviewed the substantial literature on the subject to assess current dollar value of each service, including runoff prevention, carbon sequestration, pollination and



Florida roads are flanked by thousands of planted acres. Sustainable practices can reduce maintenance costs and turn this land into an important asset.

other insect services, air quality, invasive species resistance, and aesthetics. Values for each service were summed and then reduced to a fractional percentage to compensate for variations among studies and across time. This approach may have underestimated the true worth of some services, but it led to a set of defensible values, able to meet the scrutiny this issue might receive as a public asset and expenditure.

The estimated value of all services considered was about \$500 million. This amount doubled when the amount of right-of-way planted in turfgrass was reduced and sustainable management practices were used. Adding Designated Natural Areas (DNAs) of native plant communities and wildflower plantings increased the total value to \$1.5 billion, more than compensating for any maintenance costs. Carbon sequestration alone is of greater value than maintenance cost, and could generate income for FDOT via sale of carbon credits.

The project's findings show the high value and benefits of the roadside ecosystem and sustainable management practices. Implementation of project recommendations for landscape design, construction, and maintenance can turn roadside vegetation from a liability to an important and productive asset.