



Forest Ecosystem Values – Central/West Texas

An Estimation of Economic Values of Forest Ecosystem Services

Healthy forests and woodlands provide a full suite of goods and services, including climate regulation, watershed regulation, wildlife habitat, biodiversity, recreation, and various cultural services. These ecosystem services are crucial to human well-being; however, most of these services do not have established market values like forest products.

The estimates shown are based on an analysis of forest resources in the area, results of existing literature, and non-market valuation techniques. The results should be viewed as conservative estimates, and are only part of a larger suite of ecosystem services provided by the forest within the area of interest. All values are reported in 2011 constant United States dollar.

Forestland

There are 50,335,717 acres of forestland in Central/West Texas. Of this amount, 49,981,718 acres occur within rural areas, while 353,999 acres are found within urban and community areas.

Value of Forest Air Quality Regulation within the Area of Interest

Forests in urban areas have the ability to purify the air by removing various pollutants. Based on estimates from the Urban Forest Effects (UFORE) model, the value of forest air quality regulation in Central/West Texas is estimated to be \$2.3 per acre for a total value of \$115.9 million annually.

Value of Forest Biodiversity Services within the Area of Interest

Forest biodiversity services are critical for species presence, abundance, and longevity. This service was valued at a base rate of \$232 per acre. In addition, “hotspots” of ecologically significant areas were valued at an additional \$51.75 per acre. The value of forest biodiversity services in Central/West Texas is \$242.4 per acre per year for a total value of \$12.2 billion annually.

Value of Forest Carbon Sequestration within the Area of Interest

Forests have the ability to remove and store carbon from the atmosphere through the process of photosynthesis. This service was estimated using a carbon value of \$22 per metric ton. Carbon storage

was amortized over 20 years using a 3% discount rate to determine an annual value. The total value of forest carbon sequestration in Central/West Texas is estimated to be \$65.9 per acre per year, for a total value of approximately \$3.2 billion annually.

Value of Forest Cultural services within the Area of Interest

Forests provide people with many non-material benefits important for spiritual enrichment, mental development, and leisure. Based on a 2012 survey, the average household in Texas was willing to pay between \$0.54 - \$2.22/yr for a 1,000-acre increase in forest area depending on the type of forest. These results indicate the cultural value of the forests in Central/West Texas is estimated to be \$910.7 per acre per year, for a total value of approximately \$45.8 billion annually.

Value of Forest Watershed Services within the Area of Interest

The value of forest watershed services (water capture, filtration, and regulation) in Central/West Texas is estimated to be \$95.4 per acre per year, for a total value of approximately \$4.8 billion annually.

Total Value of the Selected Forest Ecosystem Services within the Area of Interest

The value of assessed ecosystem services provided by forests in Central/West Texas is estimated to be \$1,316.7 per acre, for a total value of approximately \$66.3 billion annually.

Economic Value of Selected Forest Ecosystem Services

| Ecosystem Service | Rural Value (thousand \$/year) | Urban Value (thousand \$/year) | Total Value (thousand \$/year) |
|-------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Air Quality | - | 115,857.0 | 115,857.0 |
| Biodiversity | 12,115,585.7 | 84,452.7 | 12,200,038.4 |
| Carbon | 3,303,904.0 | 12,598.6 | 3,316,502.5 |
| Cultural | 44,974,043.1 | 866,496.5 | 45,840,539.6 |
| Watershed | 4,420,897.0 | 381,537.6 | 4,802,434.6 |
| Total | 64,814,426.6 | 1,460,942.3 | 66,275,369.0 |

Total Annualized Value of Selected Forest Ecosystem Services

