



Using iTree Model in Clark County, Nevada

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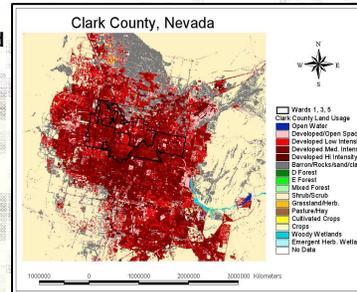
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Objective:

Ecosystem services are the services and benefits that human populations obtain from nature. Many of these services go unnoticed. Whether surrounded by a forested, coastal, or urban area, ecosystems provide recreation, food, shelter, cleaner air and water. As the climate and environment change due to human activity, an understanding of the existing natural resources becomes paramount. The objective is to quantify different components of the Clark County, Nevada urban forest utilizing the iTree model.

Study Area:

Clark County is located at the southernmost tip of Nevada and includes the cities of Las Vegas, North Las Vegas, and Henderson. This desert area is heavily developed with a growing population.



For this initial trial, municipal tree inventory data, from three electoral districts of the city of Las Vegas, were analyzed.

Methodology:

iTree is a free, peer-reviewed software suite developed by the USDA forest service. The iTree Streets module can provide information on species distribution and the monetary benefits of an urban forest in the categories of energy, storm water, air quality, carbon dioxide, carbon stored, and aesthetic value.

The module required: STRATUM climate zones, tree species, and diameter breast height (DBH).



Municipal tree inventory data was obtained from the City of Las Vegas Planning. The data was imported into Microsoft Office Access® and uploaded into iTree Streets. The local population, land area, street and sidewalk width averages, estimated municipal budget and planting cost data were entered in the module to ensure better iTree results.

Results:

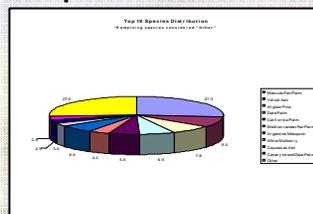
By utilizing local budget information, public tree inventory data and iTree software, the ecosystem services provided by the urban forests of Clark County, Nevada are becoming quantified and tangible.

Results for Wards 1, 3, and 5 of the Clark County area suggest an annual net monetary gain of \$38,623 from maintaining the current urban forest. The most abundant species is the Mexican Fan Palm. The youngest and oldest species are the *Fraxinus oxycarpa* (Caucasian Ash) and *Washingtonia filifera* (California Palm), respectively. Total annual benefits can change depending on the species distribution, as some trees are better suited for a desert environment. According to the iTree Species module, the *Abies bracteata* (Bristlecone Fir) could have a positive impact on the total annual benefits.

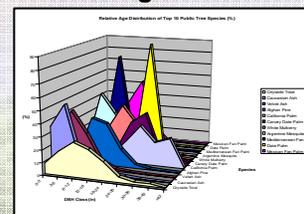
Total Annual Benefits

Benefits	Total (\$)	\$/tree	\$/capita
Energy	56,725	7.57	0.20
CO2	5,108	0.68	0.02
Air Quality	13,651	1.82	0.05
Stormwater	13,459	1.80	0.05
Aesthetic/Other	160,180	21.37	0.56
Total Benefits	249,123	33.24	0.88
Costs			
Planning	20,000	2.67	0.07
Contract Pruning	22,000	2.94	0.08
Pest Management	10,500	1.40	0.04
Irrigation	32,000	4.27	0.11
Removal	40,000	5.37	0.14
Administration	28,000	3.74	0.10
Inspection/Service	8,000	1.07	0.03
Infrastructure Repairs	13,000	1.73	0.05
Litter Clean-Up	26,000	3.47	0.09
Liability/Claims	10,000	1.33	0.04
Other Costs	1,000	0.13	0.00
Total Costs	210,500	28.09	0.74
Net Benefits	38,623	5.15	0.14
Benefit-cost ratio	1.18		

Species Distribution



Relative Age Distribution



Acknowledgements:



<http://www.itreetools.org>

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*Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.

iTree is a valuable first step in understanding local urban forests. The Southwest Ecosystem Services Project, SwESP, would ultimately like to make use of other iTree modules to conduct a county-wide assessment of Clark County, Nevada. With continued research, the SwESP may be able to utilize iTree results to develop other complementary interactive tools for resource managers to assess, maintain, and develop their local urban forest and provide the public with educational resources to make informed decisions regarding their urban