

## LARGE LANDOWNERS – Connecting the Dots

**Large Landowner Chapter written by Eric Hall-Floden, Rachel Geekie, Dakota McKune, and Leslie Du, ISU Forestry Students 2020**

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### Executive Summary

The purpose of this project is to evaluate several large landowners within the city of Des Moines, who are governed autonomously. The landowners were assessed in terms of the impacts on the Des Moines urban forestry environment and their adherence to the Public Works Forestry Division Urban Forestry Master Plan (UFMP). They were weighed against the plan's primary objective to increase the urban forest canopy cover by 3% in Des Moines by 2045.

Additionally, this project focused on understanding the objectives and missions of each large landowner in an attempt to synthesize effort and planning across organizational lines. Landowners were questioned concerning whether they have an ongoing project or a plan with the potential to affect the overall tree and canopy environment in Des Moines. GIS mapping was also employed through ArcMap to delineate the boundary of each large landowner's property in order to ascertain their potential for contribution to the City of Des Moines urban forest canopy.

Due to the difficulties encountered in the process of contacting each landowner given time constraints, some of the landowners were not able to give feedback that reflects their interest regarding the overall objective of the Urban Forestry Master Plan. There was, however, some additional useful information garnered. For example, the total acreage, the i-Tree percent cover estimates, and overall canopy cover estimates per land parcel for each of the major landowners.

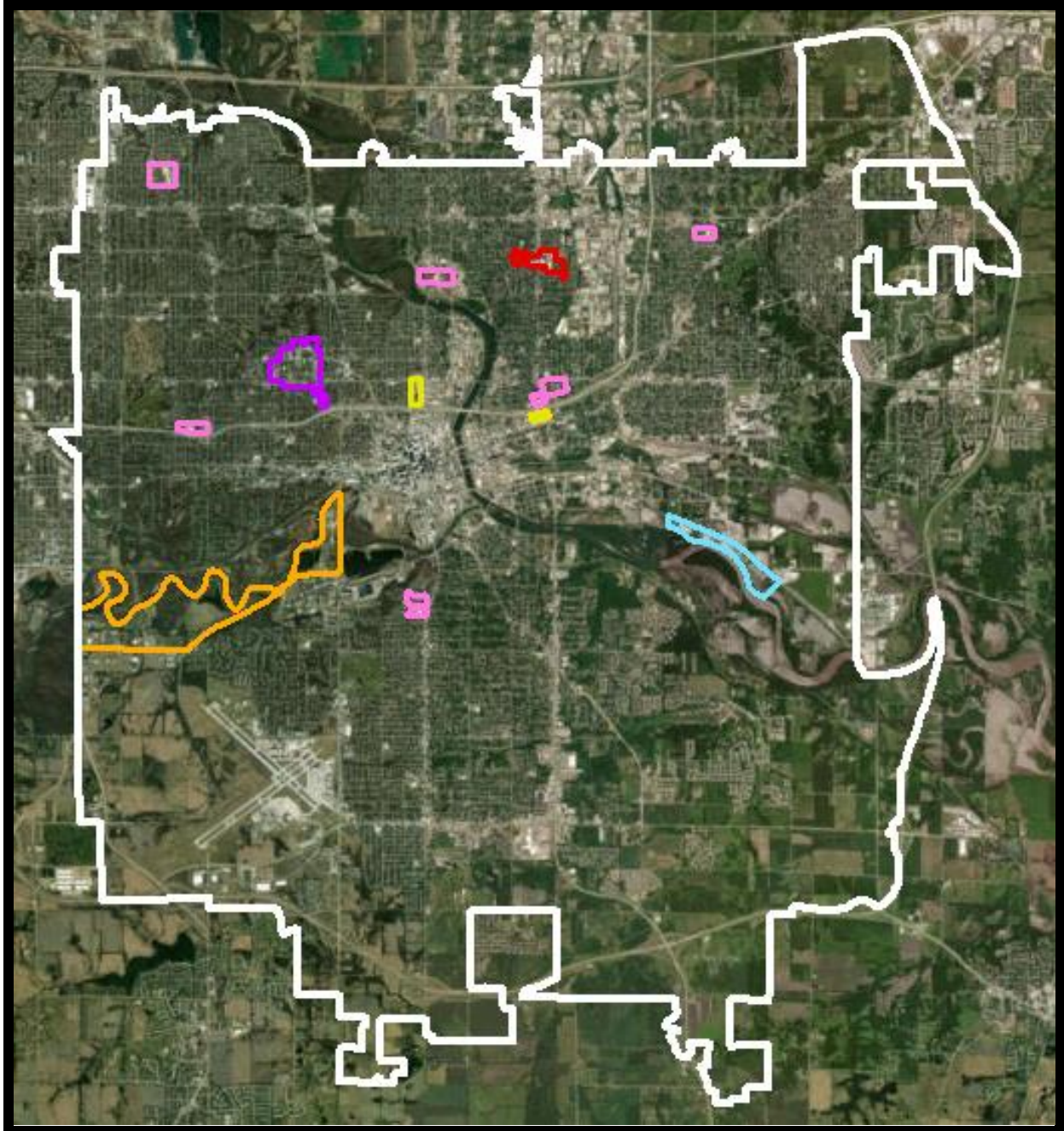
This information will allow officials in Des Moines to have a better understanding of canopy cover in the city, and the opportunities to expand it. These results can be used in a variety of ways, including highlighting which landowners are the most vital to communicate with about their tree canopy.

### **Primary Objective**

The primary objective of this project was to evaluate large landowners in the City of Des Moines and their impact on the Public Works Forestry Division Urban Forest Master Plan (UFMP). The UFMP proposes to establish a larger urban forest canopy by working with the community and City officials to implement larger green spaces within Des Moines. This aligns with Iowa DNR's geographic mandate to add 3% to the urban forest canopy by 2045. The City of Des Moines is accountable for this goal within its city limits. Project efforts focused on contacting large landowners not owned by the City, along with surveying their percent tree canopy coverage. This afforded the opportunity to gauge Des Moines' progress towards this goal. The large landowners included public schools, universities, water treatment organizations, and others. The aim was to maximize information gathering concerning these organizations while attempting to align their goals with the Urban Forest Master Plan.

### **About the City**

The City of Des Moines spans approximately 58,000 acres. Of this total, 57,000 acres is land, leaving the rest as water. Tree canopy covers approximately 17,000 acres (29% tree canopy). The percent contribution to this canopy made by large landowners was established using clear property lines. The overall acreage of those areas was determined through the utilization of the GIS modeling software, ArcMap version 10.5.1. Using i-Tree's Canopy Tool, canopy coverage presence was surveyed within each site via the random generation of 20 sample points to establish a baseline for the City of Des Moines to build from.



**Figure 1.** City of Des Moines (white border) and all large landowners.

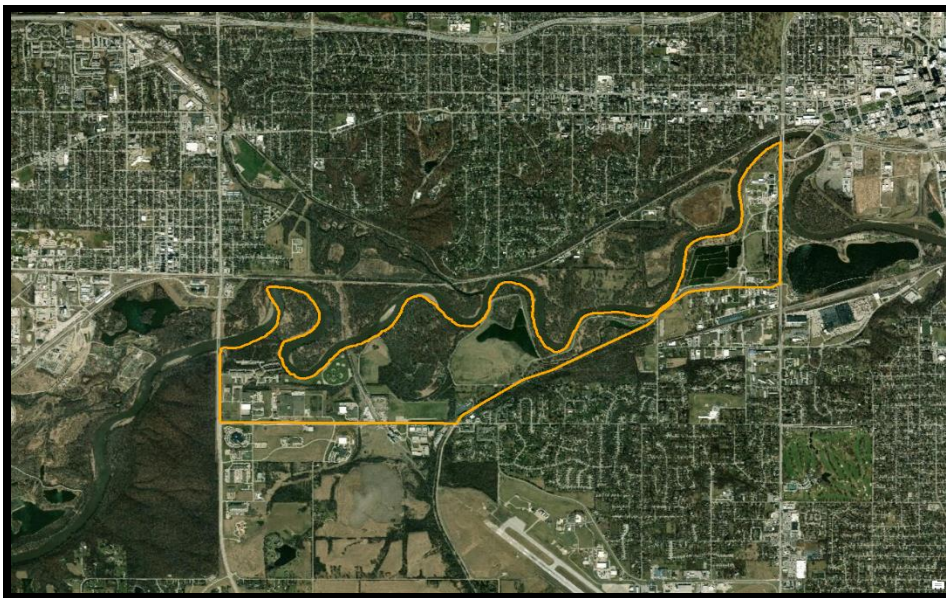
- Pink represents DSM Public Schools
- Yellow is DMACC
- Blue is WRA
- Orange is DSM Waterworks (largest non-government landowner)
- Red is Grandview University
- Purple is Drake University.



## Large Landowners

### Des Moines Water Works

The Des Moines Water Works is a regional utility that provides clean and safe water for the City of Des Moines and surrounding communities. It is responsible for maintaining water lines underneath the city. In addition, it offers a variety of educational resources about pollution prevention, water conservation, and emergency water preparedness. Water Works also owns Water Works Park and the Maffitt Reservoir. Water Works Park is approximately 1,600 acres of forest, trails, water, and the Lauridsen Amphitheater. The amphitheater was opened in 2019, which called for the removal of trees that have since been replaced by trees planted elsewhere in the park. In 2000, Des Moines Water Works began operating the L.D. McMullen Water Treatment Plant at Maffitt Reservoir to meet water demands of the growing population of Des Moines. The forested watershed of the lake acts as a buffer to help protect the waterway from urban disturbance agents such as road oils and grease.



**Figure 2.** *Des Moines Water Works.*

The Des Moines Water Works Park and facilities are shown in Figure 2. The park covers a total land area of approximately 1,600 acres. According to i-Tree, the percent of tree cover within its bounds is roughly 60%. When calculated against the total acreage, the canopy cover is 961 acres.

This is by far the largest landowner of concern. When contacted, they did not share their current management plan but do try and plant back any trees removed for construction.

### Grandview University

Grandview University is a privately-owned university in north central Des Moines. It sits on approximately 100 acres of land and is located in the heart of Des Moines. Currently, Grandview does not have any public plans detailing their forest management or efforts to mitigate their impact on the environment.



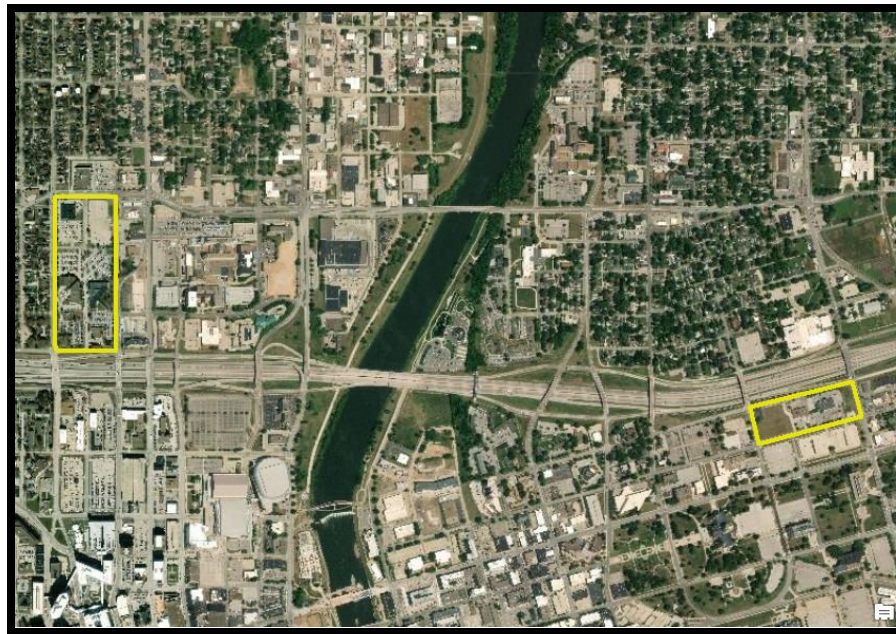
**Figure 3.** *Grandview University.*

The land area covered by Grandview University's campus is shown in Figure 3. The total land area is around 100 acres with an i-Tree percent cover estimate of 10.8%. This works out to 10.8 acres covered by tree canopy. We were unable to successfully contact Grandview.



Des Moines Area Community College

The Des Moines Area Community College (DMACC) is a community college with several campuses across Iowa. The Urban, West, Capitol, Southridge, and Evelyn K. Davis Center, and transportation center are all located within Des Moines. DMACC has additional locations in other cities such as Ankeny. DMACC has its own plans for a greater presence of green infrastructure within its campus called the DMACC Green Initiative. The main focus of this program is to encourage recycling and reduce waste. DMACC also has an educational program that focuses on wind energy. The Urban campus has a program called Sustainable Urban, which promotes sustainability by connecting and engaging with the surrounding community. The campuses located in Des Moines do not have as much green space as typical universities because they are in a metro area surrounded by buildings.



**Figure 4.** *DMACC Urban Campus (left) and Mercy Center (right).*

The Des Moines Urban Campus and Mercy Center is shown in Figure 4. These are the only campuses we selected to map because the acreage of most other DMACC campuses is insignificant. The total land area between the Urban campus and Mercy Center is around 58 acres. The i-Tree canopy cover is 9.9% and the total canopy covers 5.7 acres. DMACC exists within a highly urbanized area, a limitation when attempting to expand tree canopy cover. When

contacted, the college representatives explained that a team of arborists and maintenance personnel care for their grounds but did not provide any forestry master plan.

### Wastewater Reclamation Authority

The Des Moines Wastewater Reclamation Authority (WRA) treats wastewater from Des Moines, as well as from 16 other municipal, county and sewer district entities. It is committed to being green, utilizing a tree “plant back” policy. This ensures that any trees removed by the organization for underground construction projects will be replanted. The Wastewater Reclamation Authority has achieved many milestones over the course of its existence. The WRA consider themselves a green organization overall, which makes further commitments to energy conservation. Commitments include the following: reducing electrical and natural gas usage, increasing biogas production and use, and increasing on-site electrical generation. The WRA highly values several practices as a green organization. For example, they generate biogas through anaerobic digesters and use it as a fuel. They use their effluent for process water and washdown. Before adding to digesters, they concentrate their waste activated sludge, which reduces energy requirements during processing. They also return the nutrients from the biosolids to farm fields, reducing nutrient loss. They are always looking for ways to reduce energy consumption and increase their energy efficiency during any working process.



**Figure 5.** WRA facility at 3000 Vandalia Road on the east side.

The Wastewater Reclamation Authority is mapped above. It covers 268 acres. The i-Tree percent cover is 7% since the tree canopy covers 18.8 acres. This location also has a considerable amount of structures present so expansion of forested areas is unlikely. When contacted, the WRA did not share a plan but explained their tree mitigation strategies using the plant back program.

### Drake University

Drake University is a mid-sized, private university in Des Moines. With about 3,000 undergraduate students and 1,900 graduate students, Drake's campus measures approximately 105 acres. Drake University is committed to sustainability and lessening its environmental impact. In 2013, Drake created a Climate Action Plan, its main goal is to reach



**Figure 6.** *Drake University.*

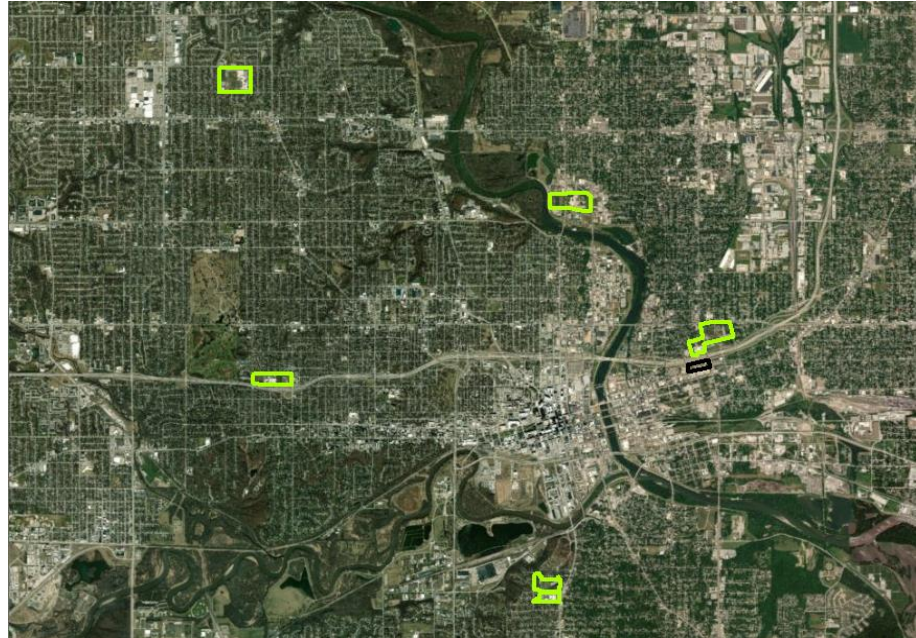
climate neutrality. They have set the ambitious goal of reaching carbon neutrality by the year 2050. Drake also offers a plethora of classes on environmental sciences. Drake has a total land area of 307 acres. The i-Tree percent tree cover is 21.3% and its canopy cover measures 65 acres. Drake maintains a significant land area within Des Moines and represents one of the most valuable and likely candidates to align itself with the UFMP. Drake University is a Tree Campus USA as recognized by the National Arbor Day Foundation (Des Moines is a Tree City USA with the same organization).



## Des Moines Public Schools

The Des Moines Public School District is the largest provider of public education in the state of Iowa. The District is committed to providing the best education possible to its diverse community. Over the last ten years, the District has been renovating schools. Fifty-seven of them have earned Energy Star designation. This designation is given to buildings that generate fewer greenhouse

gas emissions than typical buildings. Over sixty schools are a part of this district. The District has four preschools, thirty-eight elementary schools, twelve middle schools, and nine high schools. This chapter records the acreage of the five biggest schools in Des Moines. The top five



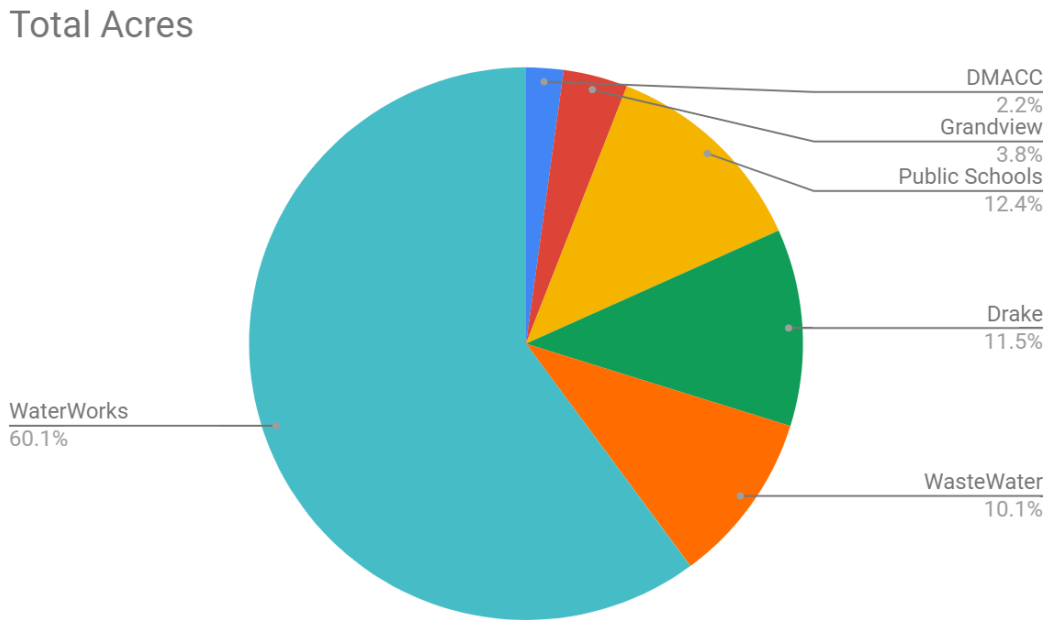
**Figure 7.** *The 5 largest schools in Des Moines are high schools.*

largest schools are all high schools, including North High School, Hoover High School, Roosevelt High School, East High School, and Lincoln High (see Figure 7 above). The total land area for all schools in the district is 329 acres, within which i-Tree estimated a percent tree cover of 14% covering 46 acres. The Des Moines Public Schools District is a massive entity, with a similarly massive purview. Such a large amount of land under their ownership entails many valuable opportunities to increase tree canopy coverage, the plantings of which could double as an educational aide. When contacted, this organization apparently did not have a forest management plan but did hire arborists to care for their trees as needed.

**Final Results All Large Landowners**

Landowner	Total Acreage	% tree cover	Canopy
DMACC Urban	58 ac	9.9%	5.7 ac
Drake University	307 ac	21.3%	65 ac
Grandview University	100 ac	10.8%	10.8 ac
DM Public Schools	329 ac	14%	46 ac
WRA	268 ac	7%	18.8 ac
DMWW	1601 ac	60%	960.6 ac

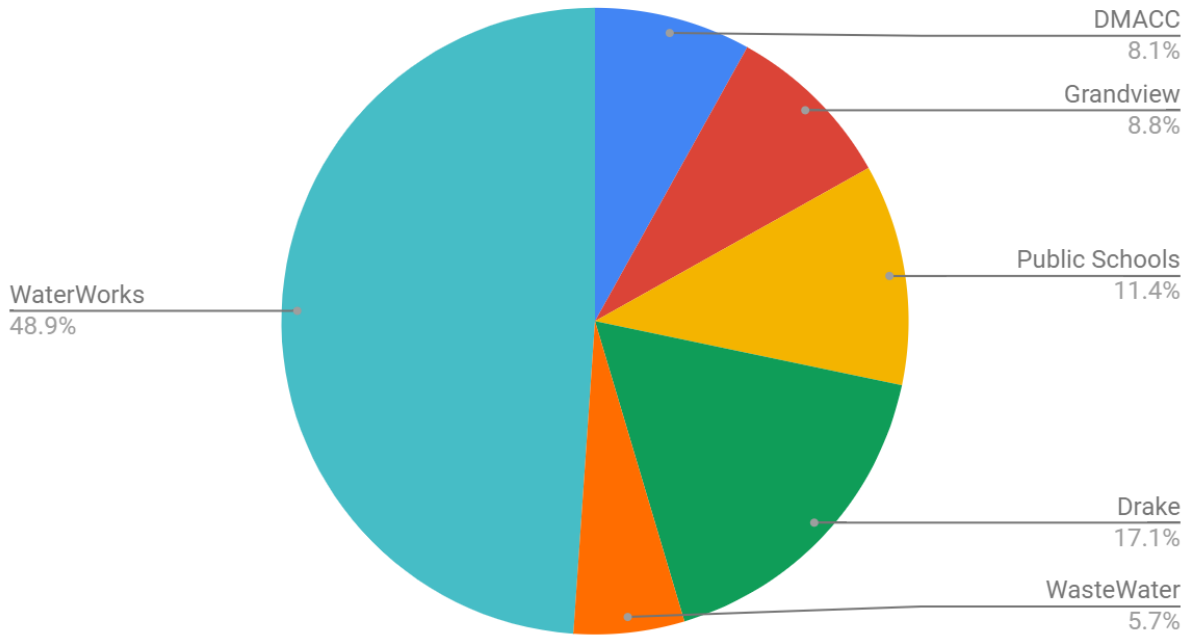
**Figure 8.** Chart of all landowner acreages and canopy cover



**Figure 9.** Total Acres of large landowners.

Figure 9 above shows the total number of acres that each landowner occupies. The DSM Water Works is by far the largest, with its total acreage taking 60.1% among other large landowners. DMACC is at the small end of the scale with 2.2%.

### Tree Canopy %

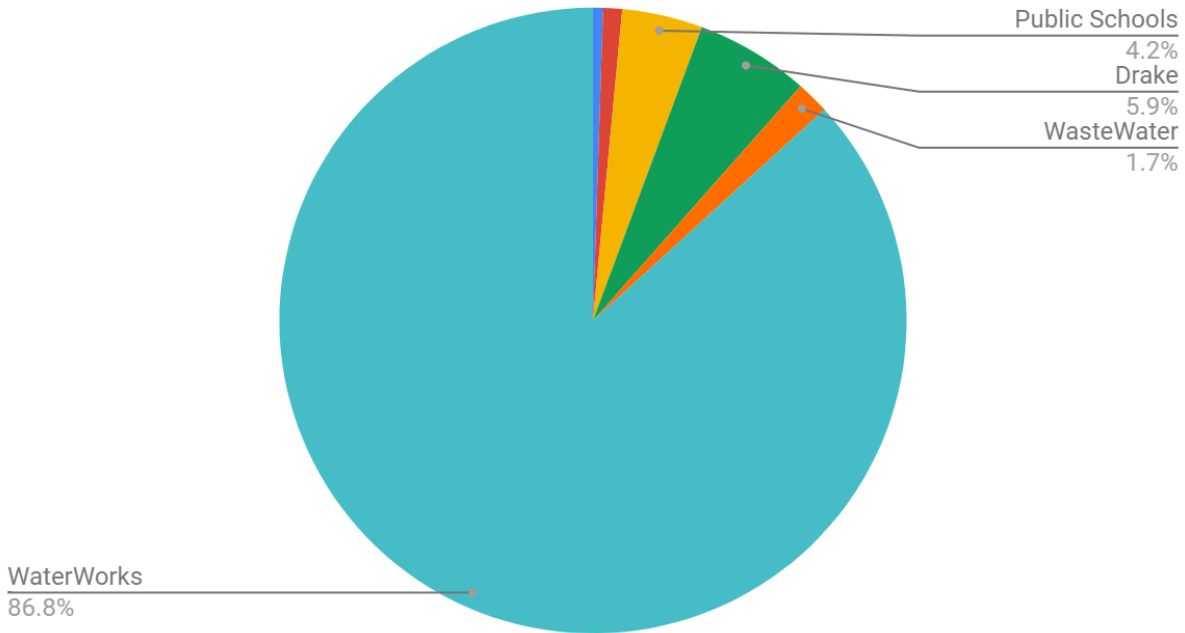


**Figure 10.** *Percent Tree Cover.*

Figure 10 above shows the percent tree cover under each landowner's purview. It is important to note that even landowners with smaller acreages, can have a high percent of tree cover. Wastewater Reclamation Authority had a higher acreage than DMACC or Grandview but it has lower percent tree canopy.



## Tree Canopy Acres



**Figure 11.** *Tree canopy (ac).*

Figure 11 above shows the total tree canopy cover in acres for each of the landowners. Again, Water Works has the highest with 86.8% of their land being canopy covered. The rest of the landowners all have less than 10% of the overall canopy cover. These landowners could be important allies in helping to increase tree canopy by 3%.

### Summary

The compiling of information of large landowners is an effort to promote relations amongst organizations in coordinating management of urban forest plans. Landowners may be interested to build relationships with resource specialists and foresters and to work cooperatively with other landowners to manage their own land. The potential services provided by large portions of land include the preservation of habitat, upkeep of endangered species, and provision for ecological services, such as stormwater management. Establishing a biodiverse and interconnected forest canopy through the cooperation of a few major companies not only builds a social relationship, but an ecological one as well. Land fragmentation causes risk to migrating species that may seek

resources from their typical residency. Promoting and advocating for improved cross-boundary relations is important in providing safe sites of transportation and utilization for numerous species. Also, the preservation of sites can provide a community service whether it be through carbon sequestration or water management.

Cross-boundary management requires voluntary participation amongst large landowners towards specific landscape management goals, either economic or ecological, through cooperation and coordination. Many large landowners exercise an economic role just as much as they do a social role. They hold the responsibility of utilizing their lands wisely and with thoughtful regard. It is possible that the promotion of participation by multiple landowners will establish a cohesive and dynamic plan for the future. Landowners often naturally respond to the market and the current economic state rather than taking account of environmental risks. By responding to cooperation and sustainable initiatives, organizations are better equipped to respond to the challenges of climate change.

#### RECOMMENDATIONS:

- Continue dialogue with, and provide education to, large landowners inside city limits
- Establish benchmarks for each entity to help Des Moines increase tree canopy by 3%
- Connect TreeKeeper Volunteers with planting projects for each landowner partner
- Provide public education on the benefits of increasing canopy on large tracts of land

#### Bibliography

Des Moines Water Works: <http://www.dmww.com>

Grandview University: <https://www.grandview.edu>

DMACC: <https://www.dmaccc.edu/Pages/welcome.aspx>

Wastewater Reclamation Authority: <http://www.dmmwra.org/>

Metro Waste Authority: <https://www.mwatoday.com/>

Drake University: <https://www.drake.edu/>

Des Moines public schools: <https://www.dmschools.org/>

i-Tree Canopy <https://canopy.itreetools.org>