

Stormwater and Street Trees

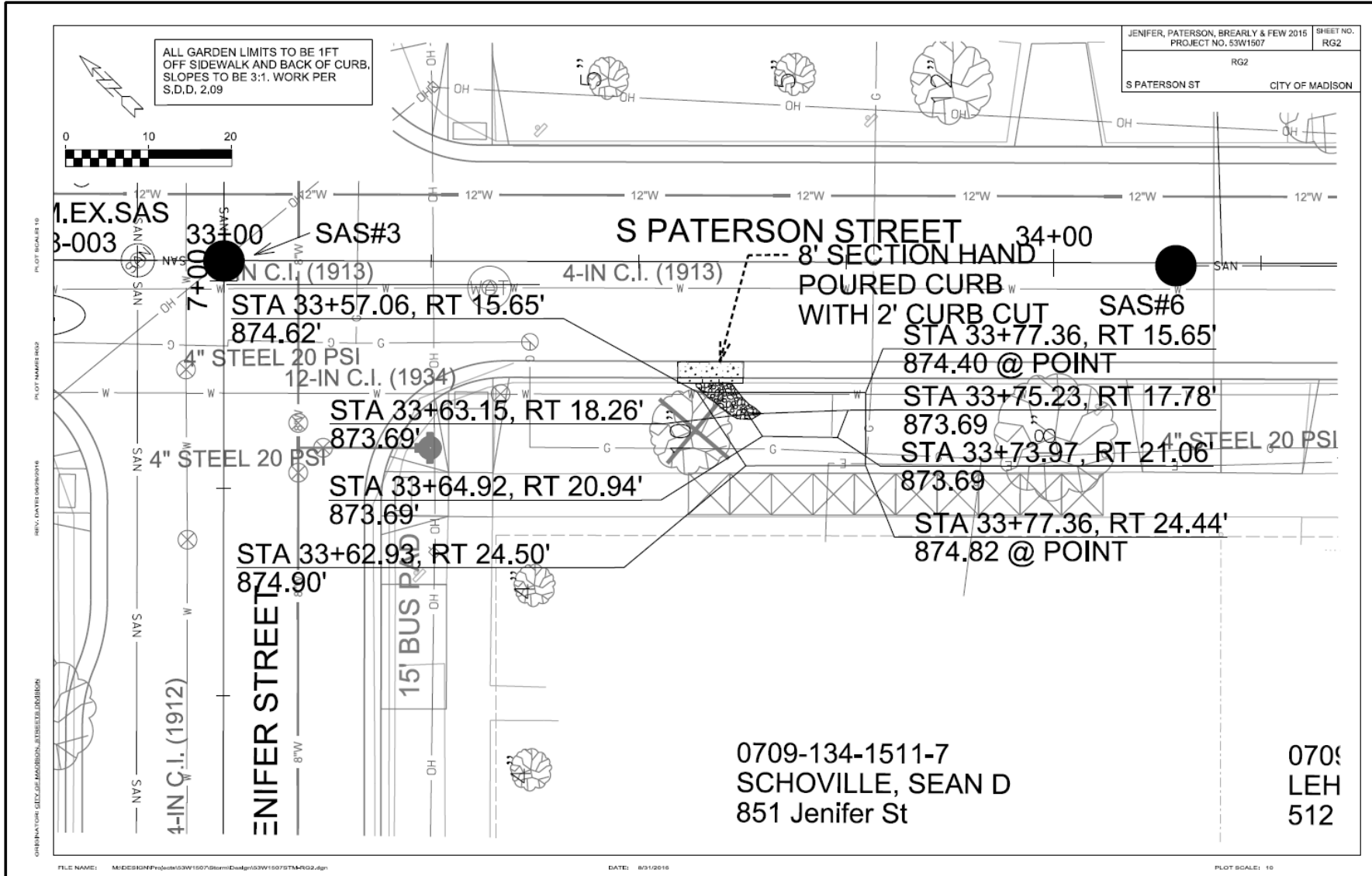
Phil Gaebler

City of Madison Engineering

Outline

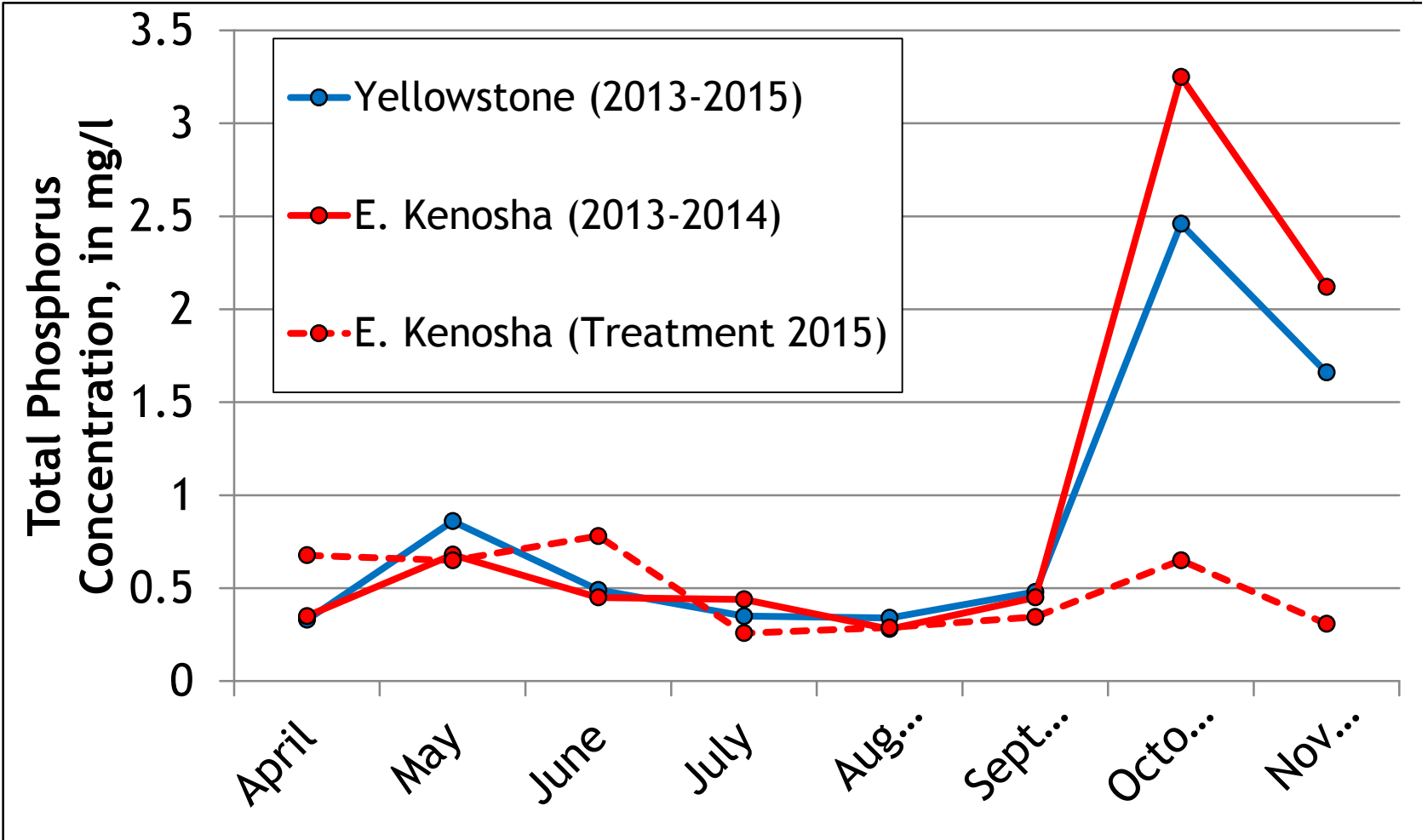
- ▶ Rain Gardens and Street Tree Conflict
- ▶ Leaf Study
 - ▶ Observed Reductions
 - ▶ Phosphorus Leaching Potential
- ▶ Citizen Education/ Action
- ▶ DNR Guidance Document
 - ▶ TMDL Goals and Leaf Impact

Jenifer Street

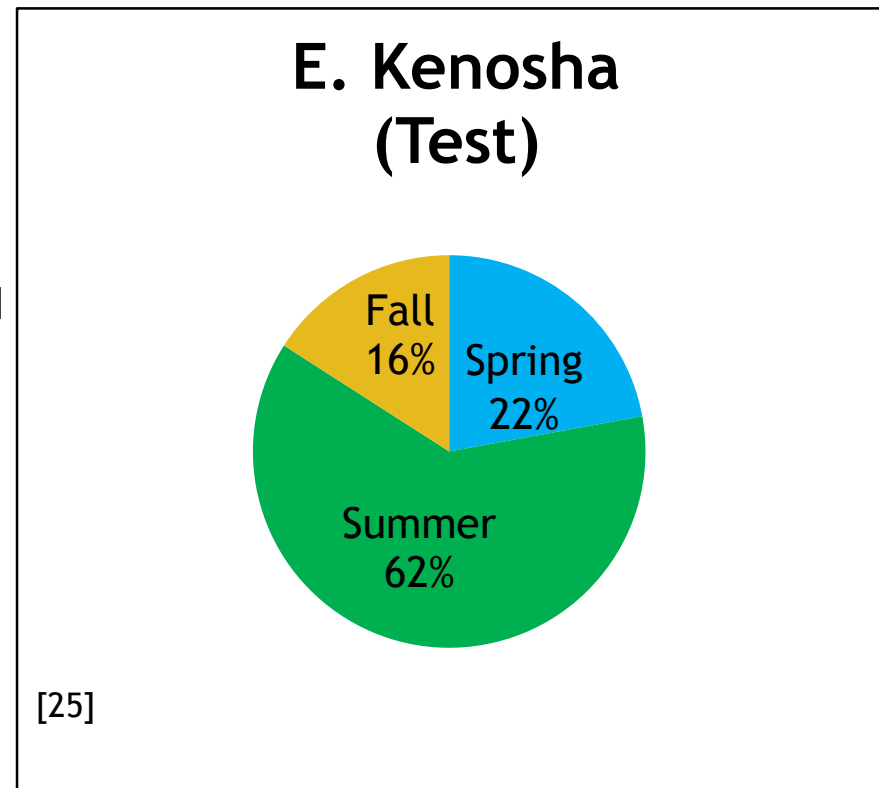
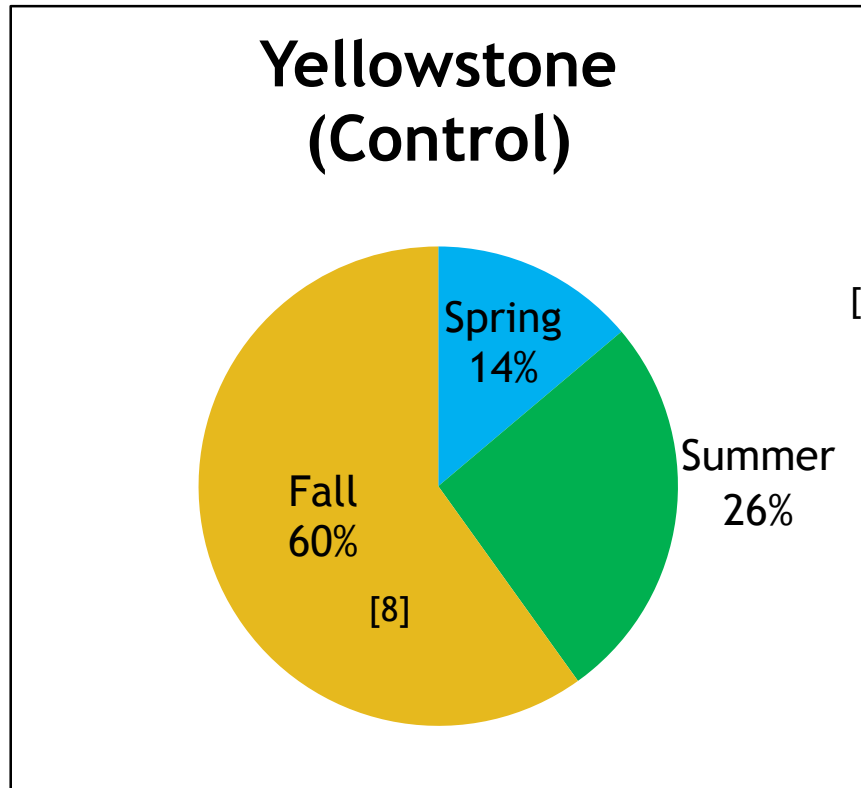


Leaf Study





Seasonal Total Phosphorus Load as a Percent of the 2015 Annual Load (winter excluded)



[3] = Number of events

Weekly Vacuum Sweeper Impact



10/5/2017

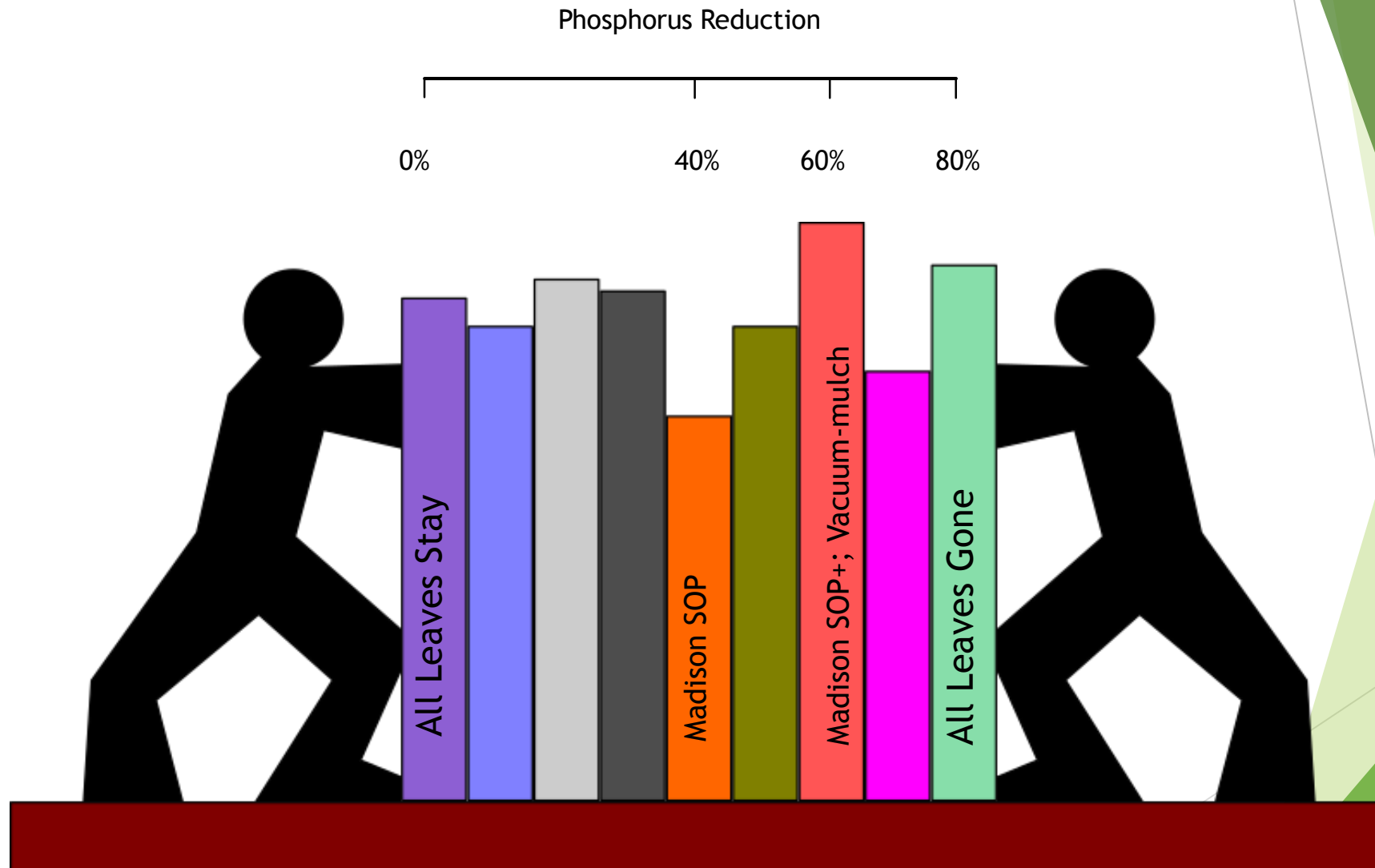


10/6/2017



10/9/2017

Collection Impacts on Total Phosphorus



Citizen Action

- ▶ Leaf piles on grass
- ▶ Rake leaves from the street before storm
 - ▶ Sign up for Alerts:
 - ▶ www.Ripple-Effects.com
- ▶ Compost on site
- ▶ “Chop and Drop”
 - ▶ Mowing frequently may be enough for some.

Leaves Out of the Street



Keeping **leaves out of the street** is one of the simplest ways to help keep **Lake Wingra** clean. Leaves are a big source of **phosphorus**, a nutrient that feeds **weeds and algae** in our lakes. When they get driven over and rained on, leaves release phosphorus, which gets sent to the lake via the nearest storm drain.

We Need Your Help!

**Keep Lake Wingra clean:
Keep leaves out of the street.**

BE INFORMED

Know when to expect leaf collection in your neighborhood by bookmarking the City web site. Tell your neighbors!

RAKE

Leaves should be raked just before collection so they don't blow into the street.

MAINTAIN

Keep leaves out of the street while waiting for City leaf collection

www.cityofmadison.com/streets/yardwaste/

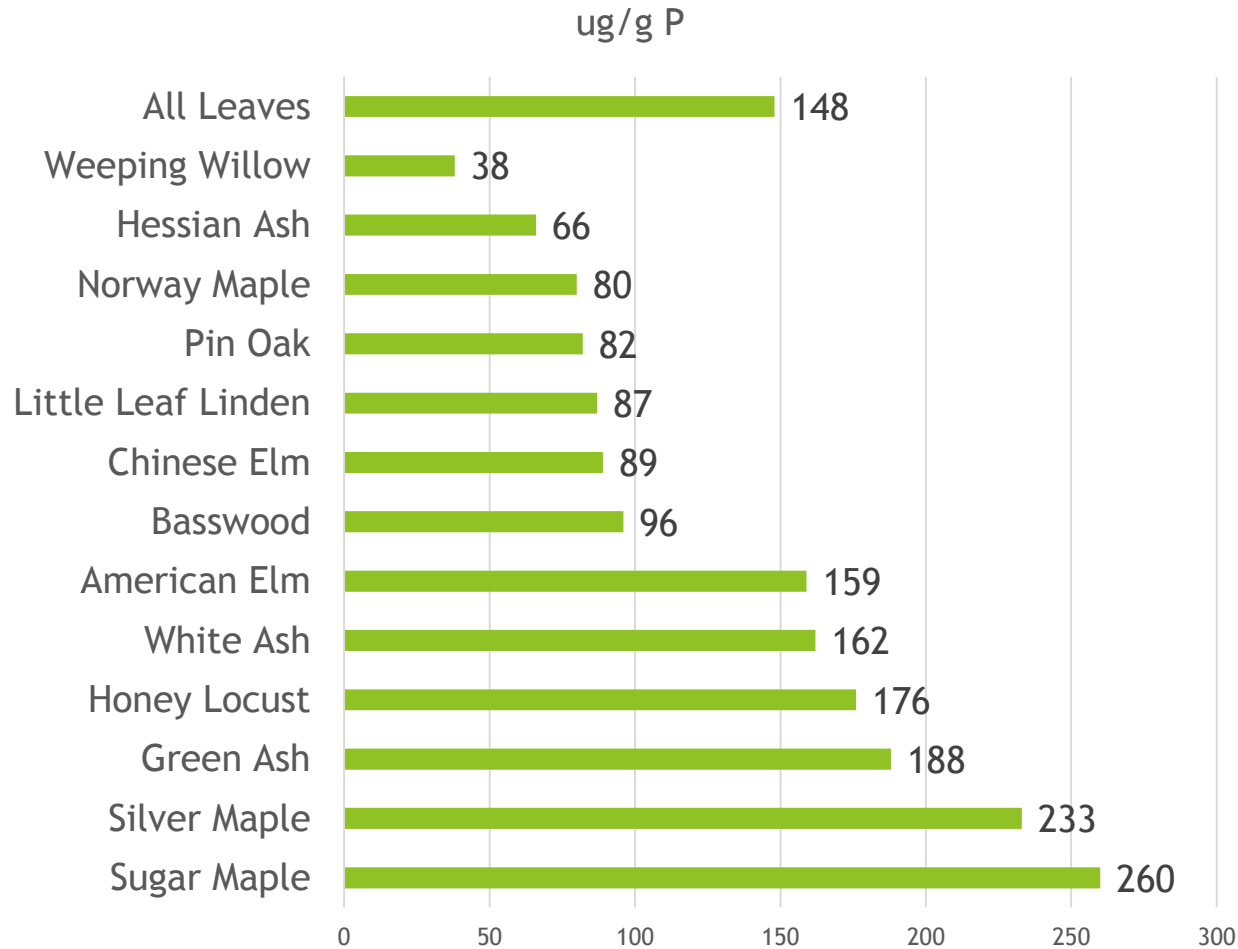


Want an alternative to raking leaves to the curb?

Use your leaves as fertilizer!

You can **mow over** leaves on your grass to grind them up or **compost** them for use on your gardens next year.

Canopy Species Impact



From Dorney 86

▶ Green Ash Replaced with Little leaf Linden

▶ $1 - ((188 - 87) / 188) = 46\%$ Reduction

However: Currently no mechanism for credits.

- ▶ Leaves in streets decay and change.
- ▶ More data needed
- ▶ Monocultures are not robust
- ▶ UW Graduate Student working on this now

DNR Guidance

Credit: 40% in Fall TP Load

Requirements:

- ▶ Medium Density Residential
- ▶ High Canopy Cover
 - ▶ Mature Tree every 80 feet of curb
- ▶ Must use Madison Collection Frequency
 - ▶ 4 collections per year

Results: ~ 300 lb of Phosphorus reduction

TMDL Goal for Madison : 13,000 lb TP
4,000 lb in City Goal

▶ Existing Costs:

- ▶ \$2.3 million for leaf collection and composting
- ▶ In 2016: 15,774 tons of leaves collected



Conclusion

- ▶ Street Trees are a limiting factor in constructing terrace rain gardens
- ▶ The phosphorus contribution of leaves is 50% of residential contribution
- ▶ Frequency of collection is key to control
- ▶ Phosphorus reduction credits are new and cautious
 - ▶ Additional research will likely expand collection credits
- ▶ Shifting the canopy species mix may result in less phosphorus leaving the City, but credits doubtful.