# Braemar Golf Course Natural Resource Enhancements

Edina City Council December 17, 2019

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## **Braemar Golf Course Features**

- Academy 9 Course and Driving Range (2015-2016)
- Main Course Reconstruction (2016-2018)
- Desired Natural Resource Features:
  - Flood Storage
  - Wetland Buffers
  - Native Prairie
  - Oak Savanna
  - Wetland Mitigation



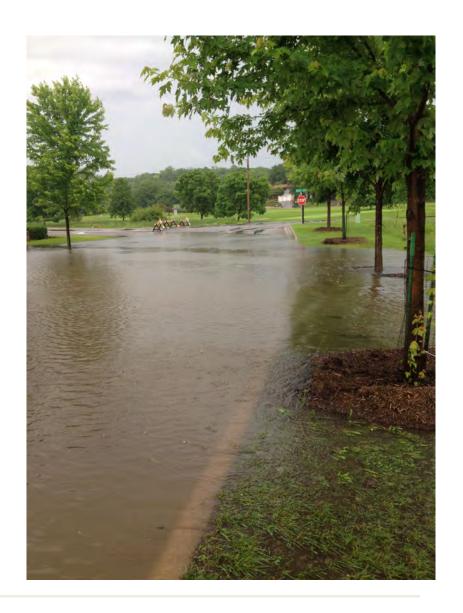
# **Pre-Project Conditions**

- Frequent flooding and poor drainage
- Lack of wetland buffer
- High density of invasive species
  - Buckthorn, purple loosestrife, reed canary grass, cattails
- Lots of turf with high management needs
- Lack of natural areas



# Flooding Issues







# **Poor Drainage**



# **Lack of Wetland Buffers**



**Invasive Species** 



# **Water Quality**



# **Lots of Turf**



# Goals to Incorporate Natural Resource Enhancements

- Provide flood storage
  - Improve drainage, direct flooding to non-course areas
- Establish wetland buffers
  - Improve water quality
- Manage invasive species
- Convert turf to prairie where space is available
- Restore or establish oak savanna
- Restore or create wetland





**Create Flood Storage** 



**Direct Flooding to Non-Course Areas** 



# **Establish Wetland Buffers**



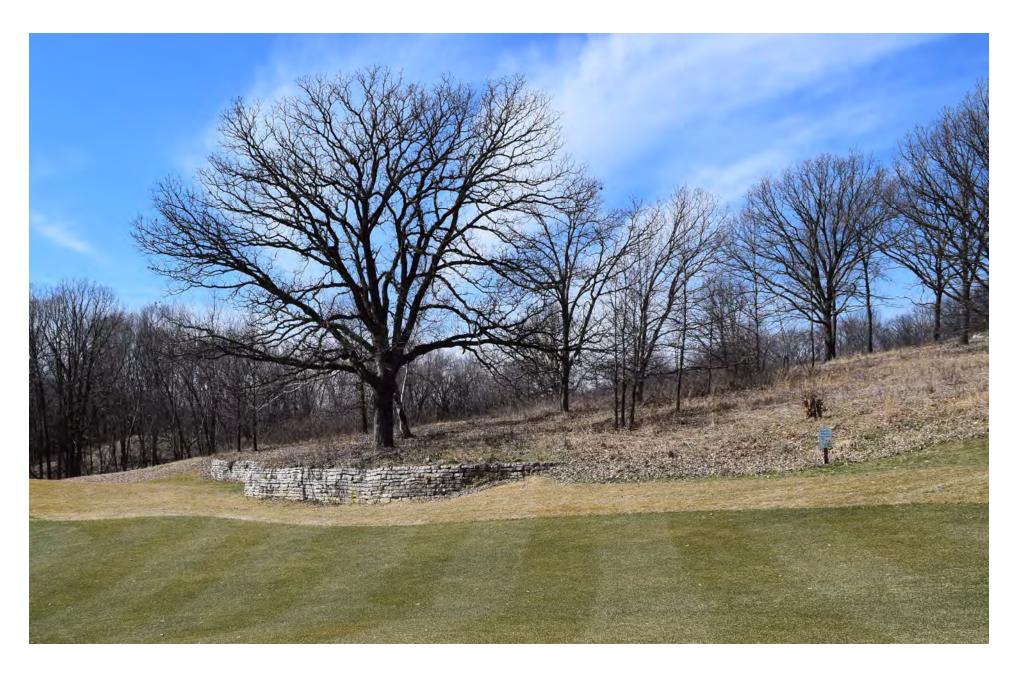
**Restore Oak Savanna** 



**Establish Oak Savanna** 



# **Restore Native Prairie**



**Establish Native Prairie and Reduce Turf** 



**Establish Native Prairie and Reduce Turf** 



## **Provide Educational Opportunities**



# **Summary of Accomplishments**

A lot has been achieved for both projects



# **Academy 9 Accomplishments**

2015 2018 Prairie

# **Academy 9 Accomplishments**

#### Summary of Academy 9 Enhancements

| Caninary of Academy o Emilancements |              |               |                          |  |  |
|-------------------------------------|--------------|---------------|--------------------------|--|--|
| Feature                             | Pre- Project | Post- Project | Difference               |  |  |
| Flood Storage                       | 2.1 acre/ft  | 9.8 acre/ft   | 7.7 acre/ft more storage |  |  |
| Maintained turf                     | 37.1 acres   | 29.1 acres    | 8 fewer acres of turf    |  |  |
| Oak Savanna                         | none         | 6.2 acres     | 6.2 acres added          |  |  |
| Native Prairie                      | none         | 7.4 acres     | 7.4 acres added          |  |  |



# **Main Course**





# **Main Course Accomplishments**

#### Summary of Main Course Natural Resource Features

| Feature                 | Changes  |  |  |
|-------------------------|--|--|--|
| Flood Storage           | Provided 0.77 acre feet of storage and moved storage to off-course areas |  |  |
| Wetland Buffer          | Installed 18.22 acres of wetland buffer (16.67 required)                 |  |  |
| Prairie and Oak Savanna | Installed 29.77 acres (none required)                                    |  |  |



# **Wetland Impacts and Mitigation**

- Both areas had some unavoidable wetland impacts
  - 0.11 acres on Academy and 0.37 acres on Main
- Nine Mile Creek Watershed District requires replacement on-site
- Two mitigation sites proposed
  - Requirements were exceeded



**Academy Wetland Before** 



**Academy Wetland During Construction** 





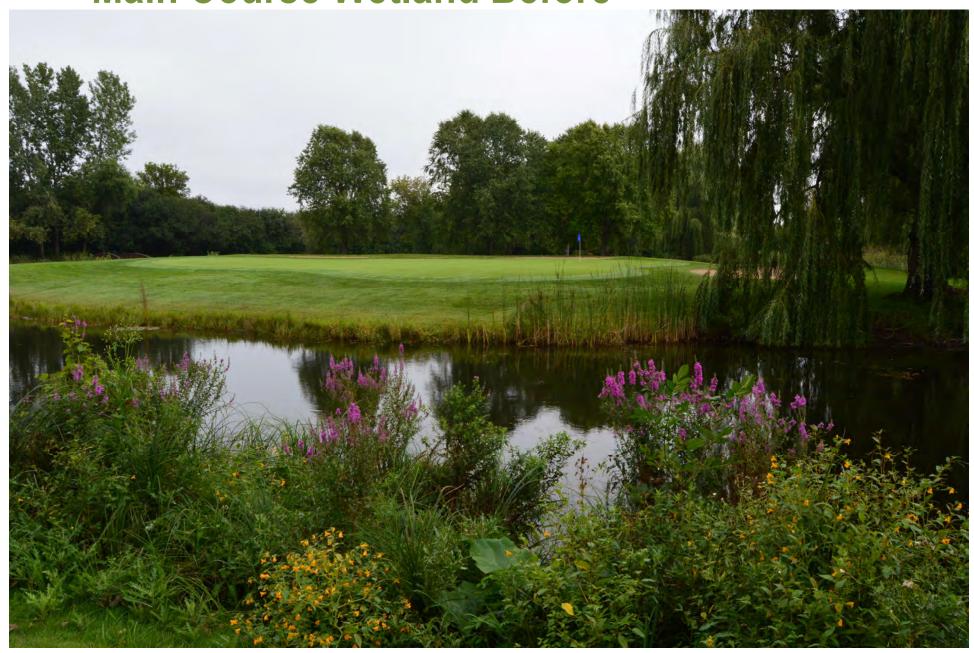
# **Academy Wetland Now**



**Academy Wetland Now – Tons of Plants** 



**Main Course Wetland Before** 



# **Main Course Wetland During Construction**



# **Main Course Wetland During Construction**



# **Main Course Wetland Now**



# **Wetland Accomplishments**

#### Summary of Wetland Impacts and Replacement

| Location          | Wetland<br>Impacts | Acres or Credits<br>Needed | Acres or Credits Provided                               |
|-------------------|--------------------|----------------------------|---|
| Academy<br>Course | 0.11 acres         | 0.25 acres<br>0.25 credits | 0.25 acres<br>0.25 credits                              |
| Main<br>Course    | 0.37 acres         | 0.83 acres<br>0.83 credits | 7.65 acres<br>3.87 (USACE)credits<br>2.83 (WCA) credits |



# **On-Going Monitoring and Maintenance**

- Manage natural areas
  - Combination of contractor, staff, and 3<sup>rd</sup> parties
- Annual monitoring to track progress and guide maintenance
- Regulatory requirements
  - For wetlands, annual reporting is required



## **Summary of Accomplishments**

- The City has successfully incorporated a variety of natural resource enhancements at Braemar
- These are good for the environment, and also add to golfers' experience
- Provide a demonstration/education opportunity
- The majority of the enhancements are elective
  - or when required were exceeded
- A source of pride for what was achieved



# **Drones and Annual Reporting\***

https://vimeo.com/showcase/6581116

Password: braemar

\*This is by far the best way to see the site and what was accomplished.



