

Wilson Springs Wetland Preserve Trail Design

A Collaboration between the Biological Engineering and Landscape Architecture Departments

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THE PROBLEM

The Wilson Springs Preserve is 121 acres of land within the urban city of Fayetteville, Arkansas. The land was historically a prairie wetland habitat, but was overtaken with invasive woody species due to the incoming development, which threatens the survival of the Arkansas darter, an endangered species found on the site. The Northwest Arkansas Land Trust (NWALT), who gained ownership of the land in 2011, are in the process of restoring the area to its natural habitat. They would like to make the area accessible to the public. Due to the wetland habitat, the area experiences temporary flooding during and following rain events, creating accessibility issues.

THE PROJECT

A biological engineering student team collaborated with landscape architecture students to develop a trail system that would be accessible to the public during and after storm events, that would also promote education about the value of Wilson Springs and the preservation of wetlands.

DESIGN OBJECTIVES & CONSTRAINTS

The NWA Land Trust provided the team with desired characteristics for trail design and ecosystem services analysis, including the following

- Minimal impact design
- Use of low impact materials to construct the trail
- Path encompasses various wetland habitats
- Path does not disturb natural habitat
- Easily accessible to the public (including ADA guidelines)

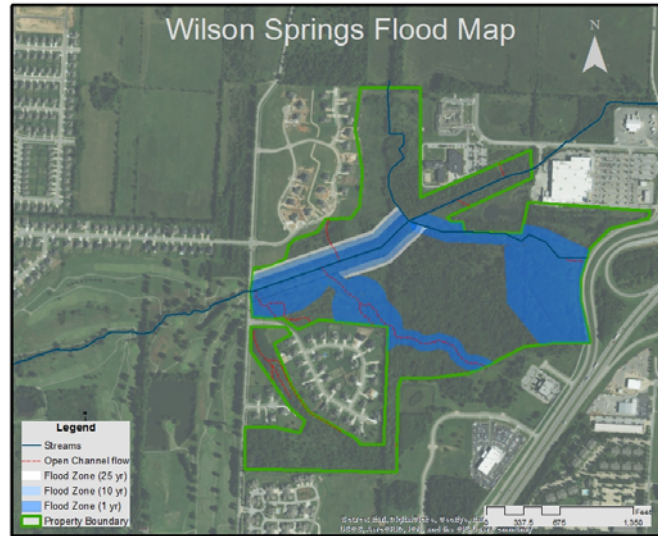


Figure 1: Flood Map of Wilson Springs



Figure 2: Flooded area at Wilson Springs



Figure 3: Clabber Creek running through Wilson Springs

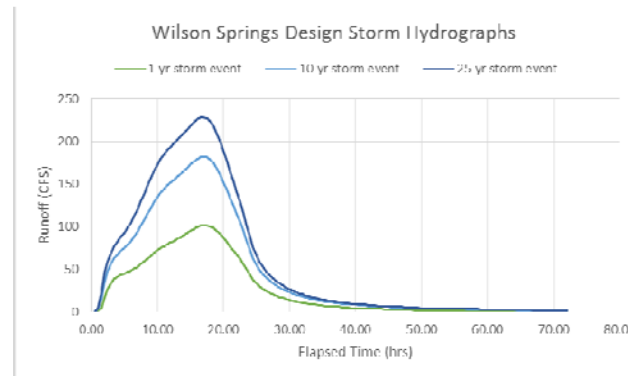


Figure 4: Graph of runoff through Wilson Springs during the 1 year, 10 year, and 25 year storm events.

FLOOD-MAPPING

A baseline hydrological analysis was performed using ArcGIS and EPA SWMM, mapping and runoff modeling softwares. For the SWMM model, we determined runoff and infiltration calculations for sub-areas within and surrounding Wilson Springs. This information was used to determine areas of inundation on site throughout storm events.

The flood map above shows flood zones and flow paths within Wilson Springs. Landscape architecture students are using this information and collaborating with the biological engineering students to determine the final trail design, which will include elevated boardwalks in flood zones.

WETLANDS PROMOTING SUSTAINABILITY

Wetlands provide many benefits. Not only do they provide vital habitat to a rich variety of organisms, wetlands also benefit the surrounding community. They protect water quality and control flooding. The wetland plant life absorbs runoff, and once it is saturated ponds and floodplains form. This process controls the slow release of runoff into our streams and waterways.

By preserving Wilson Springs, the city of Fayetteville helps to save an important habitat, as well as saving time and resources that would have been used to implement more traditional engineering structures to drain the water and direct it back to clabber creek.