Appendix 9

Conservation Easement Resources and Tools

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PREPARED BY

Brandywine Conservancy

University of Delaware Water Resources Center

Chester County Water Resources Authority

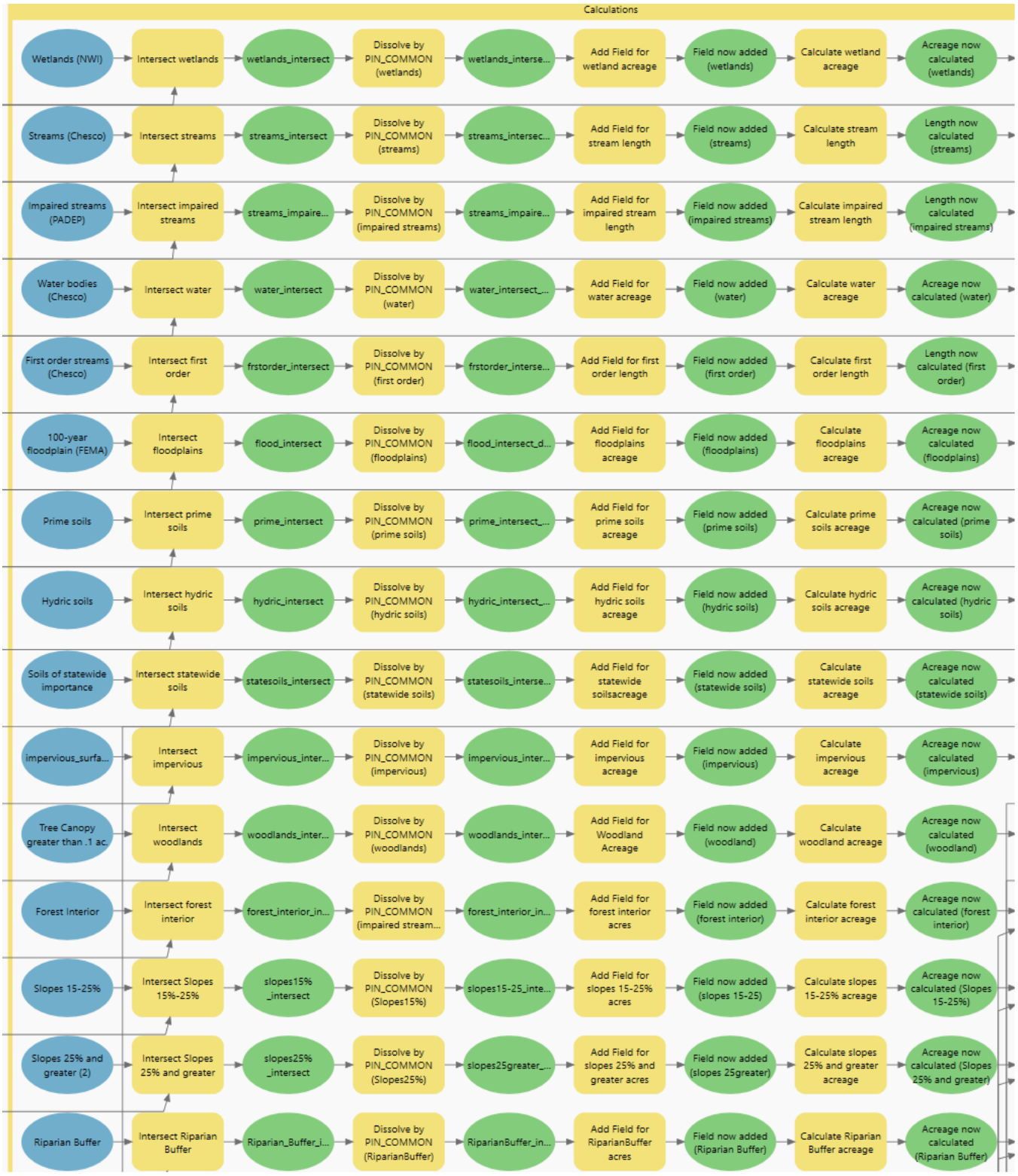
The Brandywine Conservancy relies on its Conservation Interest Project Selection Criteria (CIP) questionnaire to determine if a property meets the criteria necessary to move forward with a conservation project. All prospective projects are evaluated following a preliminary site visit and meeting with the landowner. The information collected using the questionnaire is then presented to the Conservancy's committee to further determine whether the property fits the Conservancy's mission and project criteria.

Brandywine Conservancy's Conservation Interest Project Selection Criteria

The CIP includes criteria in the categories of feasibility, qualification under IRS codes for donations, public benefit, and natural, open space, scenic, and historic resources. Within each category, there are criteria that purposely and collaterally target flood mitigation qualities within a landscape. Some of these include intense land development in the surrounding area, contribution to the area's ecological viability, presence of wetlands, steep slopes, floodplain protection areas, and riparian corridors.

The Brandywine Conservancy also evaluates potential projects using GIS spatial analysis. A property can be analyzed to determine the presence of certain features such as prime agricultural soils, stream classes, steep slopes, endangered or sensitive species habitat and more. This method functions in a similar way to the CIP model but makes it easier to find more specific information and identify where various criteria overlap in a landscape, as GIS can analyze large datasets in a short period of time.

GIS staff at the Conservancy have begun developing a prioritization model that can be used to proactively identify properties with the most conservation value in a given area. The following graphic represents the model:


Calculations
Wetlands (NWI)
Intersect wetlands
wetlands_intersect
Dissolve by PIN_COMMON (wetlands)
wetlands_interse...
Add Field for wetland acreage
Field now added (wetlands)
Calculate wetland acreage
Acreage now calculated (wetlands)
Streams (Chesco)
Intersect streams
streams_intersect
Dissolve by PIN_COMMON (streams)
streams_intersec...
Add Field for stream length
Field now added (streams)
Calculate stream length
Length now calculated (streams)
Impaired streams (PADEP)
Intersect impaired streams
streams_impaire...
Dissolve by PIN_COMMON (impaired streams)
streams_impaire...
Add Field for impaired stream length
Field now added (impaired streams)
Calculate impaired stream length
Length now calculated (impaired streams)
Water bodies (Chesco)
Intersect water
water_intersect
Dissolve by PIN_COMMON (water)
water_intersect_...
Add Field for water acreage
Field now added (water)
Calculate water acreage
Acreage now calculated (water)
First order streams (Chesco)
Intersect first order
frstorder_intersect
Dissolve by PIN_COMMON (first order)
frstorder_interse...
Add Field for first order length
Field now added (first order)
Calculate first order length
Length now calculated (first order)
100-year floodplain (FEMA)
Intersect floodplains
flood_intersect
Dissolve by PIN_COMMON (floodplains)
flood_intersect_d...
Add Field for floodplains acreage
Field now added (floodplains)
Calculate floodplains acreage
Acreage now calculated (floodplains)
Prime soils
Intersect prime soils
prime_intersect
Dissolve by PIN_COMMON (prime soils)
prime_intersect_...
Add Field for prime soils acreage
Field now added (prime soils)
Calculate prime soils acreage
Acreage now calculated (prime soils)
Hydric soils
Intersect hydric soils
hydric_intersect
Dissolve by PIN_COMMON (hydric soils)
hydric_intersect_...
Add Field for hydric soils acreage
Field now added (hydric soils)
Calculate hydric soils acreage
Acreage now calculated (hydric soils)
Soils of statewide importance
Intersect statewide soils
statesoils_intersect
Dissolve by PIN_COMMON (statewide soils)
statesoils_interse...
Add Field for statewide soilsacreage
Field now added (statewide soils)
Calculate statewide soils acreage
Acreage now calculated (statewide soils)
impervious_surfa...
Intersect impervious
impervious_inter...
Dissolve by PIN_COMMON (impervious)
impervious_inter...
Add Field for impervious acreage
Field now added (impervious)
Calculate impervious acreage
Acreage now calculated (impervious)
Tree Canopy greater than .1 ac
Intersect woodlands
woodlands_inter...
Dissolve by PIN_COMMON (woodlands)
woodlands_inter...
Add Field for Woodland Acreage
Field now added (woodland)
Calculate woodland acreage
Acreage now calculated (woodland)
Forest Interior
Intersect forest interior
forest_interior_in...
Dissolve by PIN_COMMON (impaired stream...
forest_interior_in...
Add Field for forest interior acres
Field now added (forest interior)
Calculate forest interior acreage
Acreage now calculated (forest interior)
Slopes 15-25%
Intersect Slopes 15%-25%
slopes15% _intersect
Dissolve by PIN_COMMON (Slopes15%)
slopes15-25_inte...
Add Field for slopes 15-25% acres
Field now added (slopes 15-25)
Calculate slopes 15-25% acreage
Acreage now calculated (Slopes 15-25%)
Slopes 25% and greater (2)
Intersect Slopes 25% and greater
slopes25% _intersect
Dissolve by PIN_COMMON (Slopes25%)
slopes25greater_...
Add Field for slopes 25% and greater acres
Field now added (slopes 25greater)
Calculate slopes 25% and greater acreage
Acreage now calculated (Slopes 25% and greater)
Riparian Buffer
Intersect Riparian Buffer
Riparian_Buffer_i...
Dissolve by PIN_COMMON (RiparianBuffer)
RiparianBuffer_in...
Add Field for RiparianBuffer acres
Field now added (Riparian Buffer)
Calculate Riparian Buffer acreage
Acreage now calculated (Riparian Buffer)

The blue oval on the left of the image represents the criteria that must be present in the search. In GIS, it is represented as a data layer. The last column of green ovals represents how the criteria is being measured; whether that's in acreage, length, or the presence of a certain feature (represented as yes or no). In addition to environmental characteristics, prioritization criteria can include proximity to other conserved lands, landowner type, and more. In conducting a search with the prioritization model, GIS users can locate properties that contain all or some of the desired criteria. In addition to the above criteria, Brandywine's prioritization model includes the following:

- Acreage of riparian buffer gaps
- Length of Exceptional Value streams
- Length of High-Quality streams
- Adjacency to protected lands
- Currently protected lands
- Located in EV/HQ watersheds
- Located within Brandywine Creek Greenway
- Contains Major/minor corridors from Greenway
- Located within BC strategic Plan Focus Area
- Located within Battlefield Strategic Landscape

Brandywine's model is designed to generate the above fields for each tax parcel in a given area. Unfortunately, this current model only includes data from Chester County, and needs to be expanded to include data from other service areas including Delaware and New Castle Counties (Brandywine Conservancy, internal communication, 2024).

These current practices allow the Brandywine Conservancy to determine, with a degree of certainty, that the properties being conserved will be beneficial to the area's overall environmental health and will have long-term benefits to surrounding lands and communities. However, Conservancy staff are working to rethink their project selection and prioritization processes to focus on those projects that will actively mitigate the effects of flooding, and that contain greater conservation value more generally.

Other Considerations for Developing Prioritization Criteria

Other organizations working to conserve land for flood mitigation include criteria not currently used in Brandywine's model to identify projects. These criteria could be considered by, and tailored for, other regional organizations depending on their specific goals and missions.

In a project conducted by a Duke University Graduate student in conjunction with the Land Trust for Central North Carolina, a GIS prioritization model was developed to identify land for riparian buffer conservation for the purposes of nutrient retention, significant natural area protection, and ease of funding (McNamara, 2011). Some of the criteria used in this model would be highly applicable in flood mitigation prioritization as riparian buffer habitat plays a big role in river and stream corridor health. One criterion from this model that could be considered for adoption is stream bank control, or, whether the same owner owns both sides of a stream bank. This is important as it determines the level of control the conserving entity could have on the stream banks, their stabilization, restoration, and wandering ability. A parcel containing both sides of the stream bank would be considered a more worthwhile project.

The Nature Conservancy, as part of the Fresh Water Network, created a Flood Plain Prioritization Tool for the Mississippi River Basin. This tool is a great example of using spatial analysis to identify areas in need of protection and provides resources to those looking to implement similar tools. The tool contains various data layers and specifications that allow users to search within the Mississippi River Basin for properties with the desired criteria. The "Flood Prioritization Tool Cheat Sheet" breaks down each of these data layers and specifications (The Nature Conservancy (TNC), n.d.). Of these, there are a few that could be considered for implementation at the Brandywine Conservancy and by other organizations.

The Floodplain Prioritization Tool includes criterion for 1 in 5-year floodplains. Currently, Brandywine's model only includes the 1 in 100-year floodplain. The shorter-range, 1 in 5-year floodplain is becoming more important to include, as climate change affects the frequency and intensity of these flood events (TNC, 2020). Where one place may have only experienced a relatively minor flood once every 5 years in the past, it may now begin seeing more intense flooding in that same time span. By including this criterion in its prioritization model, Brandywine could protect at-risk properties more proactively than with its current criteria.

Another data layer used for prioritization in the Floodplain Prioritization Tool is the Management Action required by a property. In other words, this data layer filters properties based on their need for active restoration, or passive protection. (TNC, n.d.) This can be determined by evaluating other environmental data included in the prioritization model. These criteria could be beneficial to include in Brandywine's model, as it could help further determine the feasibility of a project, and the impact the protection of a property could have. If a property needs heavy restoration and requires many resources to implement, it may be better left to another organization or taken on in partnership with the landowner or another entity. Likewise, if the property contains an active, healthy floodplain, its protection could provide immediate mitigation support and relieve its risk of development.

The Floodplain Prioritization Tool also includes at-risk wetland species as one of its criteria. While this data is obviously extremely important for the conservation of at-risk species and their habitats, it can also be used to indicate a particularly healthy, or at-risk floodplain ecosystem, and could be important to include in Brandywine's model.

For any of these criteria to be implemented in Brandywine's GIS prioritization model, the data for each needs to be available. Therefore, the first step to making any additions or changes would be locating the data. This could prove to be an issue if it is unavailable but could be used as an opportunity to bring these data gaps to light for research organizations. Some of the criteria, however, could be determined upon a visit to the property or by having a conversation with a landowner, and thus could be included in the Conservancy's CIP questionnaire as well.

Swing Weighting Systems

WeConservePA has a vast resource library containing materials and guidance for use by land trusts throughout the state. One of their articles titled, "Prioritization of Conservation Resources," outlines the different paths a land trust can take to develop and implement their prioritization process (Billett et al., 2017). One of the recommendations mentioned in this resource is using swing weighting to score potential projects based on the prioritization criteria they meet. In this method, each criterion is assigned a value. The higher value a criterion is assigned, the more important its presence in a

conservation project is. The total value of all criteria must be equal to one hundred. Therefore, if you assign a greater value to one criterion, you must adjust the values of the other criteria accordingly.

How criteria are valued depends on the organization's mission and conservation goals. If an organization is focused on protecting mature woodlands, they would want to assign criteria indicating mature woodlands higher values in their swing weighting system. The value assigned to each criterion is multiplied by the amount of that criterion in each project. For example, if a property has ten acres of mature woodland, and mature woodland has been assigned a value of ten, the total mature woodland value for that property would be one hundred. This is done for each criterion, and the values are totaled to determine a final score. This same process is repeated with multiple properties of interest. The property with the highest final score would then be considered the most important to protect (Billett et al, 2017).

Following this guidance, it can be recommended that conservation organizations using a prioritization model use a swing weighting system to prioritize lands for protection. Using the weighting system, an organization can place a higher value on flood mitigation criteria to prioritize the protection of lands with those characteristics. This weighting system can be used with a GIS prioritization model.