RESEARCH ARTICLE

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PLUS GreeN: Reconciling Urban Streams and Greenways through Placemaking

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ABSTRACT

Design and planning regarding urban streams are mostly viewed through the lens of ecological restoration the federal and state agencies. Cities and counties, undertaking the greenway and green network planning exercises mostly consider the urban streams as a sub-context, to be dealt with at a later stage or by different agencies. The middle ground between the urban streams, and urban greenways, thus often remains un-tended, and shows up as fragmented urban mosaic. Placemaking is often discussed in design and planning of architecture and landscape of urban built environment, to create a pause or interest or a place of rest for people. This paper considers placemaking as a landscape design approach to address the middle ground and reconcile the two ecologies of urban streams and greenways. A focused case research of an urban stream in northeast Baltimore is undertaken based on classic method of site-context analyses, federal, state, and local guides on stream restoration are considered and opportunities of bridging the connection are envisioned through conceptual design resolutions, underscored by the agenda of placemaking. As further research, the disconnect between various natural resources such as urban streams and urban greenways should be addressed through policies.

Keywords: Baltimore, decision-support, green infrastructure, Herring Run, landscape, Maryland, method, placemaking, planning, policy, urban stream, urban greenways.

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I. Introduction

Urban stream restoration gained momentum in the Chesapeake Bay watershed since the many of the streams were rated as impaired by the United States Environmental Protection Agency (US-EPA). Approximately 42 percent of assessed stream miles are noted as impaired based on studies from 2004 -2016 (US-EPA, 2021). The loss of aesthetically value and recreation is rated high at approx. 66 percent. Followed by aquatic life harvesting at 58 percent and fish, shellfish, and wildlife protection as well as propagation at 38 percent. Top causes of impairment are identified as pathogens, metals, nutrients, turbidity, and sediment, aggravated by urban and agricultural land uses. A number of recommendations and support resources for stream restorations are offered by EPA under 303 d section of the Clean Water Act for all stakeholders to tackle issues of impaired waters and total maximum daily loads (TMDLs) exceedances. Watershed implementation plan (WIP) is one of the widely used resource to develop a phased action plan for improving water quality of different types of water bodies. Urban stream restoration initiatives are undertaken subsequently as a project identified under WIP. Review of urban stream restoration proposals from region 3 of EPA, such as Herring run, Baltimore (MD), Upper mill creek in Anne Arundel (MD), Tinker creek in Roanoke (VA), restoration plans do refer to green networks in the towns, however lack in detailed attention to making connections with the referenced green network, and bridging spatial designs (COB DPW, 2004; AAC DCRP, 2018; USFWS, 2019). District of Columbia (D.C.) is currently focusing on regenerative stormwater conveyance projects such as through Bingham Run, Milkhouse Ford, Pope branch, Watts branch, Broad branch (D.C. DOEE, 2021). Most of these projects and design proposals consider green urban landscape strategies either as low impact development or rain gardens of reclamation of green spaces, and not explicitly focus on “green network or greenway”. The watershed has also seen an increase in greenway planning efforts. In Maryland, Baltimore city, Cecil County, Anne Arundel County, Salisbury towns all developed a greenway or a green network plan, with no specific attention to urban streams, barring the Patapsco River in Baltimore region but rivers are not the focus of this study but urban streams. Review of available green network plans and urban stream restoration plans from Philadelphia, District of Columbia, and Virginia, showed focus on the titular issue at hand and predominantly approached urban stream and urban green network planning, as separate exercises, leaving the two ecologies spatially distant as well.

The concept of placemaking has been used in landscape and architecture design or planning practice (Olin *et al*., 2008; Manzo, 2003). The concept has been applied to regional greenways design and planning, in

terms of "outlooks" or to view the picturesque nature from a remote vantage point for human viewer (Sharma, 2015 a; Fabos, 1995; Fabos, 2004; Ahern, 1995; Little, 1990, 1995; Flink *et al.*, 2001), and is more integrated in urban greenways in social domain, with shorter lengths and networks than ecology reinforcing regional greenways (Sharma, 2015 b). However, the explicit attention to placemaking making connection between the urban streams and greenways is only tacit in urban stream and greenway network plans thus leaving a room for loud recommendations. An exploration of stream restoration in an institutional campus setting has been conducted by Huang, Mitsch, and Zhang (2009). Nonetheless, the focus mainly remained on fluvial ecosystem restoration in this study, thus relegating the considerations of placemaking as a connective between the social and a natural ecology, as a missed opportunity. Other published research making case for accessibility to urban streams (Paul and Meyer, 2001), and for dynamic, scalable solutions, to reconcile urban and ecological systems in the city (Steward *et al*., 2016; Cadenasso, Steward and Grove, 2006). The current exploration of placemaking as a reconciliation tool acts at this urban social-ecological interface.

II. METHOD

The study uses a combination of case study approach for an urban stream in northeast Baltimore. A cohesive narrative of stream and adjacent neighborhoods is constructed based on literature review and field reconnaissance. The visual and informational narrative is then presented to focus groups, for assessments on disconnects in the ecologies of urban streams and greenways, and graphic visualizations of placemaking resolutions that address the issues of people-nature disconnect in addition to stream restoration. Reconciliation is viewed as a physical, spatial connectivity, with place for people to pause and engage with nature for a visual, audial, or spatial experience.

A. Review of Urban Stream Restoration in the Region for Interface with Urban Greenways

Studies on greenways design, typology and syntax clearly project the intention of creating connection between people and nature (Little 1990, 1995; Fabos, 1995; Ahern, 1995; Sharma, 2015 a, b). The intent can be transferred to urban stream greenway network, guided by site-context analysis, suitability analysis and stream ecology assessment, and low-impact development design principles. Most urban stream restorations in the region are framed as a component of the watershed implementation plans required by the National Pollutant Discharge Elimination System (NPDES) Permits and additional State, City permits, such as MS4 in Baltimore, in improving the integrity of the storm drain, open channel, and stream systems (COB DPW, 2021). Improvements to stormwater collection and conveyance system, stream habitat, biodiversity, open channel improvements, stormwater pollution control and watershed restoration plans as required by the permit, present a typical range of goals.

One of the major stream restoration efforts, undertaken by the Baltimore city is Stony run project (COB DPW, 2021; Kumar, 2007). Stony Run is a 3.3-mile-long creek flowing through the Jones Falls watershed. It starts in the north Baltimore and extend southward to the Remington neighborhood; here the stream disappears underground reappears closer to the Jones Falls in the Inner Harbor (Roland Park Civic League, 2019; Blue Water Baltimore, 2014). The reconstruction of Stony Run was undertaken through 2006 to 2008 at an estimated cost of $10 million. The stream water quality and corridor vegetation were noted as healthy and pleasant for community to engage with, through 2007-2009, the keep off signs due to deteriorating water quality started appearing six to seven years later. The broken embankments and streambank pathway posed safety and health hazard. The Upper Stony Run and the Lower Stony Run just south of University Parkway were restored to primarily address erosion issues. The stream was raised in some spots from underground pipes, wider curves were introduced, trees were removed, steep banks were flattened, u-shaped dams were constructed, and boulders were added. All these efforts aimed to slow the flow of water, resulting in less flooding, reduced erosion, and more filtering of the stormwater to reduce pollution. After the stream reconstruction, more than 200 trees were planted, as well as thousands of native shrubs and wetland plants (Blue Water Baltimore, 2014; Mahan Rykiel Associates Inc., 2017). However, the stream was not retrofitted well enough to handle rainstorms and leaving the restored stream susceptible to recurring damages, requiring recurring fixes (Pelton, 2018).

The north fork of White Marsh Run is a headwater stream, a major tributary of the Bird River watershed, begins at Harford Road and 695 and continues east, parallel to Route 43 (Baltimore County, 2017; Wood 2016). In August 2006, EPA undertook a massive restoration at this site costing about $1,110,000 (US-EPA, 2006). The restoration included reconnection of the stream to floodplain, planting of a riparian buffer, to transform the incised channel of the stream into a thriving floodplain ecosystem. The stream was recorded as stable and ecologically functional in 2006 (US-EPA, 2006). Ten years later, the White Marsh business owners were said to be dissatisfied with the County and the state over a range of highway improvements and environmental projects citing the flooding of their properties because of the projects. In 2018, the 7,000 linear feet of the West Branch of the White Marsh Run North Fork was noted as heavily eroded warranting a restoration project to regrade stream banks with natural materials, and re-planting with native trees, shrubs, and perennials (Marks, 2018).

In the late 1990s, Minebank Run exhibited severe degradation and was subjected to high sediment and nutrient runoff. Minebank Run receives a high volume of runoff from impervious surfaces in suburban residential areas, office parks, highways and other areas surrounding Towson, Maryland. Baltimore County Department of Environmental Protection and Resource Management (DEPRM) conducted two phases of restoration, in 1999 and 2005, at estimated costs of $2.2 million and $4.4 million respectively (US-EPA, 2009). Restoration included stabilization of highly erodible banks, construction of point bars , riffles, meander features, and step-pool habitats. The goal was to increase the sinuosity of the stream, and reconnection of the stream with the floodplain. Re-planting of trees and 6,000 shrubs was undertaken to, create a buffer but also to increase the uptake of available nitrogen. A review later endorsed significant reduction in the bio-reactive nitrogen concentration in the surface water and groundwater (MDE, April 2009), thus proclaiming the project as a success. Yet, a November 2016 Baltimore Sun article noted that a rock weir installed in the channel and a rock wall along the bank in the stretch flowing through Cromwell Valley Park north of the Beltway, was missing, after the project was completed in 2005 at a 4-million-dollar cost (Wheeler, 2016). This again points to the need of social agency to sustain the restored ecologies.

Lower Spring branch that empties into the Loch Raven Reservoir and is a part of the Gunpowder watershed also underwent restoration. The restoration focused on 2 miles of stream in the lower section of Spring Branch which was was once a narrow, shallow trout stream but suffered from fifty years of rapid urbanization created many impervious surfaces with few stormwater controls. Two phases of restoration addressed effects of urbanization, including the flash-flood flow regime, erosion, declining ecological function, failing infrastructure, poor water quality and property damage. The stream channel was stripped of concrete channel and stabilized using natural materials such as boulders, tree root wads, brush mattresses and live branch layers, and re-planting. While there were significant reported reductions in TMDL such as 27 percent for phosphorus, more than 30 percent for nitrogen and 45 percent for sediment and returning fishes, the Spring Branch did not still meet water quality standards of total reduced pollutant loads and improving biological data as per 2011 EPA report (US-EPA, 2011).

The Breewood tributary in the Anacostia River watershed and Booze Creek located the Cabin John Creek Watershed, both in Montgomery County, were restored using the recommended naturalistic landscape strategies channel stabilization, floodplain reconnection, aquatic habitat enhancement, vegetation planting, (MCDEP, 2019). However, Booze creek restoration suffered structural failures due to storms that occurred soon after the initial construction.

The District of Columbia is currently focusing on regenerative stormwater conveyance projects such as through Bingham Run, Milkhouse Ford, Pope branch, Watts branch, Broad branch (DC DOEE, 2021). Broad Branch Stream Restoration: (DC DOEE, 2021), conducted through February 2014 and was completed in October of 2014, focused on daylighting the 1,600-foot portion of Broad Branch, a tributary to Rock Creek in Northwest DC, to improve water quality at the location and downstream by exposing water to sunlight, air, soil, and vegetation, all of which help process and remove pollutants. Pope Branch, a first order tributary to the Anacostia River, restoration interventions collaboratively developed by District of Columbia jurisdictions, the Metropolitan Washington Council of Governments and the federal cost-sharing agreement with the U.S. Army Corps of Engineers mentions systemic interventions focusing on the stream channel, bank and broader context (DC DOEE, 2009). Most of these projects and design proposals consider green urban landscape strategies either as low impact development or rain gardens of reclamation of green spaces, and not with an explicitly intention of planning a green network or greenway.

The review of urban stream restoration projects above underscores the point that most efforts focus on ecological success, although resonating with the federal standards, and academic research such as by Palmer, Bernhardt, Allan *et al.* (2005) and Kondolf (1998), but lacking attention to both (a) creating social agency to sustain the conservation and (b) the spatial disconnect between the urban stream and urban greenway network. Also, it is observed that the currently recommended design interventions are clearly not resilient in face of storm events. Design as a way to create social agency for urban stream and greenway conservation, was under-utilized as well.

B. Herring Run

The Herring Run Stream is a key environmental feature of the Baltimore city with a diversity of flora and fauna. However, the network of environmental protection agencies such as the Chesapeake Bay trust and the city needs to play a more of an active role in supporting the revitalization of Herring Run stream (Power and Council, 2007). The Baltimore County and Maryland Department of the Environment's (MDE) have been working on regulatory components to efficiently manage various environmental and ecological resources (MDE 2019). The Herring Run masterplan that was commissioned by the city in 2017 (Mahan Rykiel Associates Inc. 2017, City of Baltimore 2020), shows the use of placemaking considerations for the Herring run park area, Herring run watershed restoration plan study in 2004 focused on stream stabilization through interventions along the stream length, with no thoughts on interface with urban green network. Number of programs by Baltimore city such as vacants to value, power to dirt, stormwater community grants, and green

network plan (Thomas *et al*., 2004; COB 2015), have been implemented over the last decade, however they are aimed at converting vacant land into greener, storm-water compliant neighborhoods, thus reinforcing the urban greenway network, and lacking attention to missing interface with urban streams in the city, particularly Herring run that flows through the Morgan State University campus serving historically under-represented community. Programs and efforts exclusively focusing on the issues of addressing the physical accessibility and green canopy disconnect, between the urban stream and urban greenways, is missing in action, especially with regards to Herring run stream which flows through minority serving Institute of Morgan State University, and a mix of diverse neighborhoods through northeast Baltimore. The issue of stormwater flows that drains from the surrounding built environment into the stream, eroding the stream banks and bringing sedimentation and pollutant load to the stream channel, are yet to be dealt with an actionable plan.

The expansion of built environment around the Herring run stream, can be seen in Fig. 1 below. The increase of built environment, roads, and reduction of green areas, riparian buffer, and stream network into a stream channel, is apparent in maps from 1944, 1953 to 2011.

A zoomed in view of Herring run stream and its urban context is shown in Fig. 2. Despite the physical proximity with the stream, as visible in Fig. 2, there is an explicit disconnect between neighborhoods and stream. The inaccessibility based disconnect with the community is partly by design due to water quality issues and the health impacts it may have for the residents.

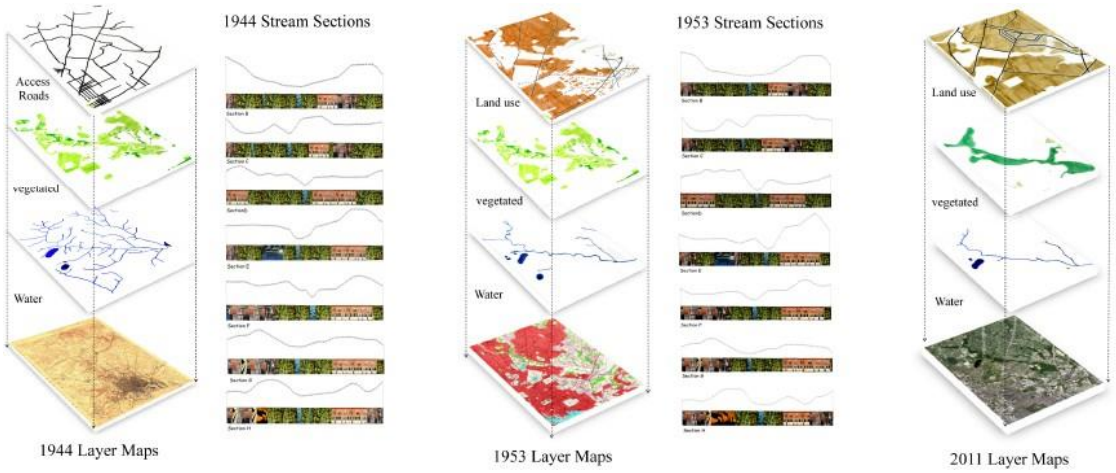

Fig. 1. Expansion of built environment around the Herring run stream. Illustration contributions by Steve Stannard, Andrew Rojek, William, Mason, Maryam Shekhomoulaki, James Brown, Elizabeth Carroll.

Fig. 2. Expansion of built environment around the Herring run stream. Illustration contributions by Steve Stannard, Andrew Rojek, William, Mason, Maryam Shekhomoulaki, James Brown, Elizabeth Carroll.

The Morgan campus community and neighborhoods have no spatial opportunities to spend some time in proximity of the water, even looking at the stream water and biodiversity from a distance, which would formulate the psychomimetic connections and memories with the natural resource, thus enhancing attachment with the stream, to serve as a stream conservation prompt. Fig. 3 diagrams the intention of this research to address the current disconnect between the social and natural ecology through place-making.

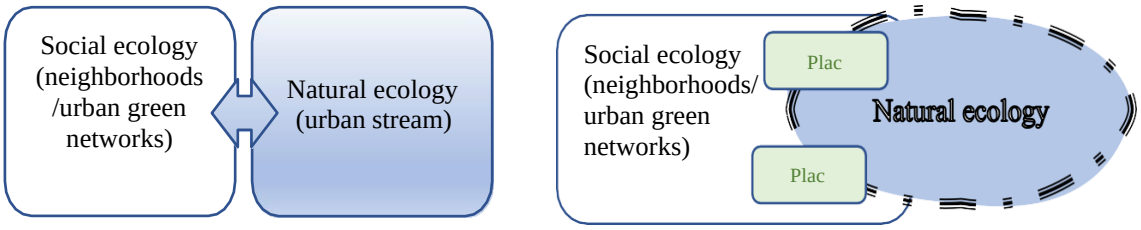

Fig. 3. Reconciling social and natural ecology: current disconnect (on left), reconciliation through placemaking (on right). Diagram by author.

III. Conceptual Resolution

A. Urban Stream

The Herring Run Watershed Stream Assessment and Restoration Concept Plan Final Report July 2004, lays out stream stabilization through vegetation, structural interventions, realignment and relocation of the channel, structural stabilization of channels, removal of channel impediments, maintenance of the infrastructure, and enhancement of the riparian corridor through tree planting (Thomas *et al*., 2004; COB DCRP, 2020). These strategies resonate with guidelines published in federal manuals and federally recommended reports on stream restoration. The focus groups were asked to focus on current stream conditions which were mapped through field reconnaissance and photo survey, presented in Fig. 2. The conditions that showed up as most aggravating, at focal study transects, through the Morgan State University included: invasive vines covering the existing trees, gully erosion due to rainwater and stormwater runoff; loss of the high flow channel, water pollution due to sewage spillage from sewer lines along the bank; and trash or debris. The focus groups went to the source of classic resolutions as documented in the Natural Resources Conservation Service, National Engineering Handbook (NEH) (USDA-NRCS, 2007), to match the best applicable restoration technique to the stream conditions. Table I below presents the stream restoration recommendations selected by the focus group based in the 2007 NEH handbook and a summary overview. The focus groups all operated in academic setting, shared landscape disciplinary training as a common factor and experience from different professional backgrounds such as arts, psychology, anthropology, and business.

TABLE I: Herring Run Issues and Focus Group Recommendations

Issues identified	Focus group recommendation
Gullies due to Rainwater Run Off / steep banks and built context	Ephemeral Gully Restoration Approach Fill the gully with a combination of wood chips and organic soil Encourages microorganisms, and insects to inhabit the area helping to abate soil erosion Planting native plants in gully as the roots will help hold the soil in place and encourage water Infiltration
Invasive Vines / due to natural process	Removal of the invasive species using a cut and drip approach Cut and Drip Approach Cut vines at base Drip Triclopyr on the cut Allow dead vines to remain to decompose so that tree limbs are not damaged during removal
Loss of High Flow Channel / due to Sedimentation.	Use a meandering approach Increasing the depth of the channel and introducing more curves Slowing the rate of water flow will restore the stream bead and reduce sedimentation
Water quality / due to pollutant loading from storm-water flows	We also need to protect the areas which have all of the watersheds and save the stream from dangerous chemicals, it also requires the conservative treatment method. The areas which are converted in to urbane or semi urban must be restored.
Biodiversity	We need to restore the vegetation in the stream by putting native species on all of the banks using ostraca removal equipment's, we also have to create a fish passage ways and open channels to restore the stream.
Early developments:	Early developments have worked on managing the channel bank, vegetations and repairing of forest buffer.
Declining Habitants and sites:	The coordinate specifications are helping is supporting management of restoring declining habitants and sites.

B. Urban Greenways

The focus groups considered the neighborhood maps and plans, from google and recent Baltimore City publication on green networks (COB DP, 2015), and asked to highlight the gaps in green network. The group highlighted the physical disconnects: within the riparian green network along the stream, between neighborhoods and green areas located across the stream, of the stream with the parks and other green areas in the neighborhood and between the stream and neighborhoods. The census reports on demographics of

contiguous neighborhoods namely Morgan Park, Loch Raven, Mt. Pleasant Park, Perring Loch, Stonewood Pentwood-Winston, Hillen, Montebello, Beverly Hills, Arcadia, Lauraville, Hamilton Hills, reveals a predominantly African American context, and a microcosmic view of Baltimore City as a whole (COB DP, 2020; U.S. Census Bureau, 2020). The city is shown to a host to 62% African American Residents, with median household income of $50,379, as opposed to the national average of $62,843, and roughly 31.9% with an undergraduate degree, at neck and shoulder gap with the national average of 32.1% (U.S. Census Bureau, 2020). Morgan State University zipcode 21251shows a walk Score of 44 out of 100, showing this as a car-dependent neighborhood in comparison to inner Harbor zipcode of 21230, with a score of 77, making it 5th most walkable neighborhood and the zipcode 21231, just west of Patterson park, north of fells point and south of John Hopkins hospital, being the topmost walkable neighborhoods with a walk score of 94 in the city (Walk Score, 2021). The stark contrast between the grey of built environment and the green of canopy cover is visible in Fig. 2. While a green connection between the neighborhoods and the stream cannot address decades of systemic sociological and institutionalized disparities for these neglected communities, it certainly helps bringing the social, psychological and health benefits offered by natural resources closer to them (Abraham *et al*., 2009; Sullivan and Chang, 2017).

IV. Design Resolution

The focus groups then worked on conceptual spatial design resolutions to address the disconnect between the urban stream and the urban green network, through "placemaking" as the meeting ground and as a mechanism to reconcile the two. The groups were asked to approach placemaking from architectural and landscape design perspective to create an inhabitable space for people, through use of natural and built materials, with emphasis on creating a positive experience for the user, with respect to natural and social attributes as well as aspects, taking inspirations from nature, while adding to value to the environment and appeal for the user to spend time in that space. Wyckoff (2014) articulated this spiel commonly used by spatial designers where sense of place is a combination of form, activity, response (or experience), and economics. The advisory on "how not to approach placemaking" was to impose dramatic patterns on site to create place, as people often tend to mention interconnected preserves and green- ways, walkable neighborhoods, proximate amenities, cultural forums, the coffee shops, and open spaces, plazas, parks for informal meetings, conversations, strolls, and active / passive recreation, when asked about their favorite spots in the city and not iconic designs (Richards, 2007). Social equity through placemaking (Webb, 2014; Wilson, 2015), was an underlying agenda that reflected in site-selection, of site in a minority-serving institute, and design discussions on belongingness - of the place-design to the site, and -of the site to the local community.

Illustrations below visualize the possibilities of a place for people to connect with the stream, visually and even through physical accessibility once the natural ecology- the stream bank and waters have been restored.

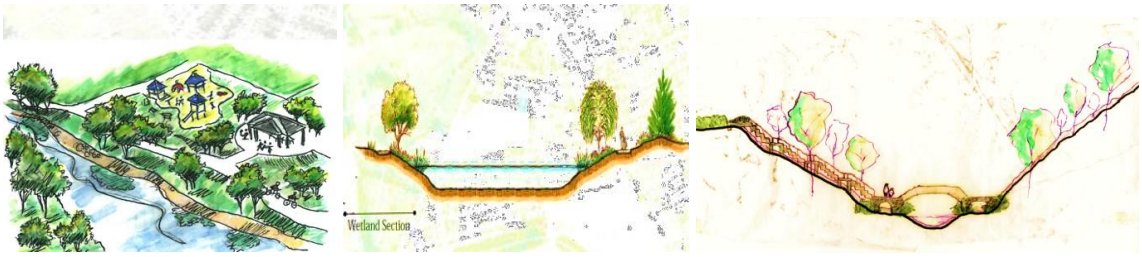

Fig. 4. Connecting people with stream. Illustration contributions by Maryam Shekhomoulaki and Sasha Reamer.

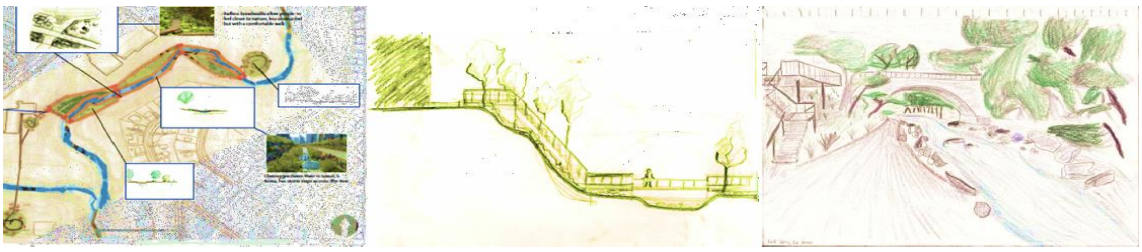

Fig. 5. Negotiating steep streambanks to connect people with the stream. Illustration contributions by Sasha Reamer, Brian Hartwyk.

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Fig. 6. Stream overlook designs voted by peer reviewers. Illustration contributions by Blake Fisher, Bradley Deise, Cedric Southerland, Caitlin Cunningham, Gisele Kennedy, Eric Farrow and Finola Perry.

The placemaking was to be cognizant of natural ecology, mapped in Fig. 7 below, highlighting the landscape systems that make the physical character and texture of the place. The preliminary mapping of the interconnected systems of other biodiversity when passing through the stream, is representative of attention to understanding the natural ecology of the place, prior to proposing interventions, for the natural and social ecologies and the interface.

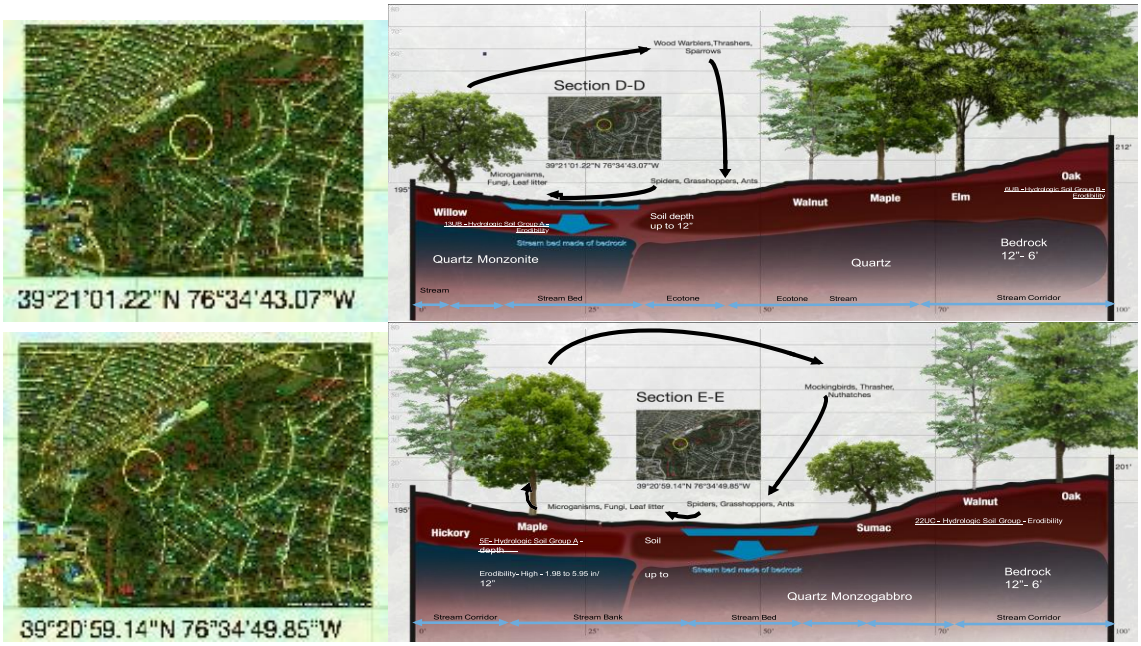

Fig. 7. Mapping to understand the natural ecology of the Herring run- plans and sections of study area. Illustration contributions by Melanie Hotham, Charlotte L'Esperance, Archana Sharma.

The places envisioned by the focus group are synthesized in terms of locations and engagement with the stream in Table II below:

TABLE II: CHARACTERISTICS AND SYNTAX OF URBAN STREAM GREEN NETWORK PLACE-MAKING

Modality of experience	Locational experience	Spatial experience and macro scale design syntax
Visual- seeing the stream	Along the stream	Water + vegetation+ overlook structures + greenway: pathways, bikeways and pocket parks
Audio- hearing the stream Water	At the stream	Water + vegetation + pocket parks
Interactive- passive interaction (no organized stream-walks, water sports, swimming)	On the stream	Water + vegetation + fishing decks + stepped deck

The design syntax of these places can be read as: (a) Water + vegetation+ overlook structures + greenway: pathways, bikeways and pocket parks, (b) Water + vegetation + pocket parks, or (c) Water + vegetation + fishing decks + stepped deck. The design syntax of places which are also being designed with storm-water resilience and stormwater management in mind, the design syntax could read as: (d) water + vegetation + greenways: pathways, bikeways and pocket parks and overlook structures + stormwater best management practices + storm-event handling interventions + habitat for biodiversity.

Components of this design syntax, such as through location of recreation next to the stream and bike path overlooking the stream and passing over the wetlands, show up in the campus scale masterplan by Huang, Mitsch and Zhang (2009). The words used by the focus groups to express the sense of place through the

visualized graphics, and verbally, were in the range of comforting, calming, relaxing, sheltering, peaceful and contemplative. Of course, none of the designers were aiming to create claustrophobic, unsafe places. Safety emerged as an issue during discussions and most designers emphasized on need of complementing daylighting the stream with placemaking, to render a sense of safety that comes with actively used social, communal spaces, with high flux of transiting population, and people watching over people. The places that received less votes than others, as shown in Fig. 6, were basically outperformed in terms of selection of location of the overlook, the overall design syntax of the overlook element itself and the view of the quality as well as design syntax of the natural ecology or landscape, as experienced from the chosen location.

The conceptual designs and imagery created in the process shows the possibilities of addressing the disconnect between the urban stream and urban greenway network in its proximity through placemaking. The designed "places" with stormwater management concern in mind, act as a landscape intervention, with capability to tackle the stormwater flooding, soil erosion, sedimentation. Fig. 8 shows a diagram of systemic interventions of places to connect the urban stream with the urban green network or the place-like urban stream greenway networks (PLUSGreeN).

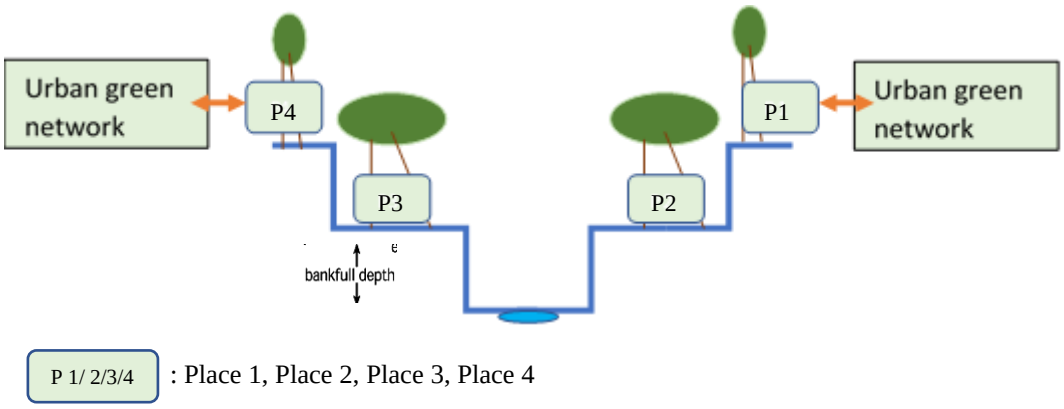

Fig. 8. PLUS GreeN: Systemic placemaking intervention in the urban stream corridor.

The labels of P1 to P4 are attributed as a reminder that a place should be created to correspond with localized site-context characteristics and needs, and also be reflected in the design syntax at each scale. While the design syntax at a zoomed-out scale of looking from a distance can be read in in terms of component elements: water + vegetation+ overlook structures + greenway: pathways, bikeways, and pocket parks (Zhang *et al*., 2018, Sharma, 2015 b). However, at a zoomed-in scale such as that of the overlook structure, the design syntax, should reveal: material (wood/ stone) + texture (rough/ smooth) + volume (open/semi-open), all with respect to local site-context considering landscape, climate but also the socio-cultural and economic, aspects.

V. Conclusion

The placemaking recommendation fundamentally calls for creation of inhabitable space for people, through use of natural and built materials, with emphasis on creating a positive experience for the user, with respect to natural and social attributes, taking inspirations from nature, while adding to value to the environment and appeal for the user to spend time in that space, where the resulting place must look and feel like it belongs to the site and the site belongs to the local community, aesthetically pleasing, green places, through creative integration of stormwater management practices such as tree planting, bioswales, rain gardens, pervious surfaces. This resonates with the proper placemaking formula by Wyckoff (2014), underscoring the combination of "proper" physical form, land use and social opportunity to trigger a strong sense of place.

Urban stream conservation requires a solid stream restoration plan, flood management system (Mekler-Culbertson *et al*., 2018), but it also a social agency. To create a natural resources conservation-centered social agency, the developers and planners need to work from the understanding that for people to care about the stream and its conservation, they need to have attachment with the natural resource or place, (Stokols and Shumaker, 1981; Manzo, 2003). Placemaking can be used a design tool that can facilitate creation of social agency. Placemaking approach and consequent place-like urban stream greenway networks (PLUS GreeN) between the urban streams and urban greenways. The PLUS GreeN place is an intermediary designed ecosystem that calls for collaboration between ecologists, hydrologists, engineers and designers, a cause supported by many (Paul and Meyer, 2001; Ross *et al.*, 2015; Felson, 2013). The proposition should be considered for developing a special use overlay for Herring run mid-stem flowing through the Morgan State University campus serving under-served communities, especially when the impact of spending time in nature has been associated with physical as well as emotional wellbeing.

The PLUS GreeN approach could be applied in any urban context, subject to prioritization of issues and funding as most germane to those geo-political, socio-cultural realms.

Policy level interventions are critical to enable design developments (Morandi, Piegay and Vaudor, 2014), this paper takes a small first step in nudging a policy discussion connecting urban streams with the urban greenways. For example, the goals and objectives of urban stream restoration as developed by the United States Department of Agriculture (USDA), either focus on anthropogenic concerns such as flooding of residential properties, agricultural land, or ecological issues of environmental quality and biodiversity habitat. Inclusion of additional goals such as (a) connection between the urban streams and urban green networks, and (b) place-like urban stream greenway network (PLUS GreeN), connecting urban streams with the urban greenways, especially in under-served urban communities to enhance their access to nature, would encourage more designers to placemaking as a systemic intervention in the stream corridor in their design alternatives.

Supplemental conservation-based education, regulatory and monitoring policies will be required for sustainable integration and connection of the currently decoupled ecologies of urban stream and urban greenways.

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DATA AVAILABILITY

All data is duly cited and can be made available per request.

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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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