Boards & Commissions Application

Harrisonburg VIRGINIA

I am interested in serving on the following boards/commissions. (Please indicate the order of preference).

1. Parks and Recreation Commission WEST 2. _____

As an applicant/member of a Council-appointed Board or Commission, your name, address, and phone number will be available to the press and public. Information will be kept on file for three years. Public discussion of information contained herein may occur in the meeting at which appointments are considered by the City Council.

☐Mr. ☐Mrs. ☐Ms. ☐Miss. ☒Dr. (Please type or print clearly)

Name: Armstrong (Last) Donna (First) L (M.I) **Date:** January 14, 2019

Home Address: 1420 Crawford Ave. Harrisonburg VA 22801 Own/Rent? Own

Phone Number: 540-433-2537 **Alternate Phone:** _____

Occupation: retired professor **Employer/Organization:** _____

E-mail: darmstrong@albany.edu **Harrisonburg resident for** 2.5 **years.**

Were you referred by anyone: ☐Yes ☒No Name of Referring Party: _____

How did you hear about volunteering on a board or commission? ☐Cable ☐Website ☐Council Meeting ☒Other: Harrisonburg Dem Committee

Why do you wish to serve on a board or commission?

I live in the Purcell Park neighborhood and I use Purcell and Highland Parks often. I am concerned about increasing effects of climate change, including flooding, insect/disease damage, and drought in our parks. I am a retired professor of public health and I have worked for over 20 years on public health education (including the value of physical activity) and environmental sustainability and food growing projects (e.g. community gardens). I would like to contribute to the potential of the Parks and Recreation programs to provide education and greater awareness on the role of our public lands and natural ecosystems to support public wellbeing.

What relevant experience or education do you have to this board or commission?

In addition to my academic experience in public health education and program design/implementation, I earned a Permaculture Design Certificate in 2018. I now have social connections with permaculture designers in Harrisonburg, who have expertise, for example, on tree species identification, creek restoration/preservation approaches, designing perennial food growing, reducing flooding with plant-system designs. For my final certification project I designed a Purcell Park Demonstration Food Forest that, in addition to perennial food growing, would also reduce flooding in a Blacks Run tributary, provide public education on perennial food growing and increase local food production. In collaboration with local permaculture practitioners, we have made a start on mapping tree species in Purcell Park, documenting erosion problems in Blacks Run creek, and discussing permaculture approaches to address increased flooding that is occurring now, and is expected to increase, with climate change.

What other interests or concerns do you have regarding the community?

In my academic research practice I worked extensively on food insecurity issues and the fragility of our food systems in the United States, which has long been recognized and discussed by the USDA. Especially with the need for climate change adaptation, there is an urgent need for local communities to work on increasing local food growing. There is also an EPA report on the environmental, economic and social benefits of "green infrastructure" in city lands (https://www.epa.gov/nps/green-infrastructure-parks-guide), which is similar to a permaculture approach, although permaculture also has an important emphasis on local food production. But this EPA report suggests federal and state economic opportunities that may be earned through 'green infrastructure' projects in city parks and other city lands. As a professor I published reports on the many social and economic benefits that emerged from food growing projects, such as neighborhood crime watch groups, shared social support for babysitting/health/domestic violence/elder care support, etc. Food growing is a great builder of local community social networks and neighborhoods. I would like to help enhance our Parks and Recreation programs to include more awareness of the importance of food growing for public community wellbeing.

Please list any past or present community involvement e.g. City Council, Board and Commissions, Citizen Academy, etc. in Harrisonburg or elsewhere:

Albany NY, Community Volunteer Service:
Member, Board of Directors, Capital District Community Gardens
Member, Solidarity Committee
Member, Capital District Alliance for Democracy
Member, NY Citizen Action
Member, Advisory Board, Occupational & Environmental Health Center

University Albany, Service:
Member, Diversity Recruitment Committee
Faculty organizer: 9/11 Teach-in and Memoriam
Chair, University Senate Council on Academic Freedom and Ethics
Member, University Senate Ad hoc Bylaws Revisions Committee
Chair, Ad hoc Committee on Administration-Governance Consultation
Member, University Senate Governance Council
Faculty member, SUNYA Peace & Justice
Founding faculty member, Campus Environment and Food Sustainability

Teaching JMU
Sustainability, JMU LLI program
Food Growing, JMU LLI program

2011-2016
After retiring from UAlbany, moved and continued development of an 8 acre sustainable farm in Burkesville, KY. This included renovating/ fencing pastures; renovating a 7-stall large (former) tobacco barn; building soil and pasture lands; installing a fish pond; farming milk goats, chickens, bees, horses; establishing a fruit orchard and large food gardens.

2016-current

DONNA L. ARMSTRONG
1420 Crawford Ave
Harrisonburg, VA 22801
(540) 433-2537 (home)
Email: darmstrong@albany.edu

November 2018

Education	Specialization	Degree	Date Received
University of California, Santa Cruz	Biology	BA (Honors)	1983
University of North Carolina, Chapel Hill	Public Health	MSPH	1991
University of North Carolina, Chapel Hill	Epidemiology	PhD	1993
Gov. Law Center, Albany Law School	Basic Mediation	Certification	2002
Campbellsville University, KY	Social Work	MSW (Honors)	May 2016
Blue Ridge Community College, VA	**Permaculture Design**	**PD Certification**	**Nov 2018**

Social Work Clinical Experience	Specialization	Dates of Service
Foothills Academy, Albany KY	residential treatment, adolescent boys	Jan 2015-Aug 2015
Adanta, Adair County, KY	community mental health clinic	Sept 2015-May 2016

Public Health Employment	Title	Dates of Service
University of North Carolina	Project Manager/Postdoc Fellow	March 1994 to June 1994
Centers for Disease Control	Epidemic Intelligence Service	July 1994 to June 1996
University of Washington	Research Scientist	October 1995 to August 1997
University at Albany, SUNY	Assistant Professor	September 1996 to Aug 2001
University at Albany, SUNY	Associate Professor, Tenured	September 2001 to Aug 2012

Teaching (at UAlbany unless noted otherwise)	Semesters Taught
Social Class and Race in Epidemiology	Fall 1997-03
Epidemiology of Diabetes	Spring 1999, 2001
Epidemiology of Cardiovascular Diseases	Spring 2000, 2002, 2004
Participatory Action Research (PAR)	Fall 2001, 2002, 2003
PAR workshop: negotiation and conflict resolution	Spring 2002
PAR workshop: mediation and communication	Spring 2002
Sustainability and Public Health	**Spring 2010, Fall 2011**
Concepts of Epidemiology (undergraduate level)	Spring 2011, Spring 2012
Principles and Methods of Epidemiology I	Fall 1996, 1997, 1998, 1999, 2000, Spring 1997
Principles and Methods of Epidemiology II	Spring 1998, Spring 2004
Principles of Public Health	Spring 2005-2010
Sustainability, JMU LLI program	**Fall 2017**
Food Growing, JMU LLI program	**Fall 2018**

2011-2016

After retiring from UAlbany, moved and continued development of an 8 acre sustainable farm in Burkesville, KY. This included renovating/fencing pastures; renovating a 7-stall large (former) tobacco barn; building soil and pasture lands; installing a fish pond; farming milk goats, chickens, bees, horses; establishing a fruit orchard and large food gardens.

2016-current

Moved to Harrisonburg, VA and began working on urban sustainable food growing, on a 0.3 acre property in the Purcell Park neighborhood. Planted (and continue to maintain) an intensive food garden, including the following fruit and nut trees/shrubs: peach, apple, cherry, almond, plum, persimmon, pawpaw, hazelnut, pecan, currants, blueberries, josta and gogi berries, black and raspberries, strawberries; extensive annual food growing. This permaculture system also includes chickens, bees, solar energy and a large system of rain catchment.

Awards and Grants:

North Carolina Affiliate of the American Heart Association, Grant-in-Aid, to complete dissertation research on potential effects of ill-defined mortality on heart disease mortality trends. (period: 7/92-6/93 amount: $10,000)

CDC Prevention Research Centers Program, Principal Investigator for a project to improve the delivery of diabetes care to American Indian women ages 40 and older. (period: 10/95 to 10/97, amount $450,000)

University at Albany, SUNY Faculty Research Awards Program Category B, Principal Investigator of a project to conduct a survey of community gardens in New York State; to identify characteristics of gardens and gardeners which are associated with greater garden longevity, productivity, neighborhood support, and aspects conducive to community development. (period: 4/97 to 4/98, amount $2,999)

New York State Affiliate of the American Heart Association, Scientist Development Award, Principal Investigator of a project to examine community occupational structure, basic services, and coronary mortality in New York State, at multiple points in time, during 1980-95. Also, analysis of joint effects of individual social class position and level of community resources on coronary mortality rates. (7/98 to 6/01, amount $134,979)

University at Albany, SUNY Faculty Research Awards Program Category A, Principal Investigator of a project to conduct a community ethnographic study, which will identify community characteristics that may be central to community coronary mortality levels and trends. (period: 4/99 to 4/00, amount $9,998)

Ford Foundation, Principal Investigator of a project to examine effects of racial segregation on bus transit access to medical and grocery services and medical care (period 6/02-8/03, amount $100,000)

University Albany, Service:

Member, SPH Diversity Recruitment Committee	1997-00
Faculty organizer: 9/11 Teach-in and Memoriam	2002
Chair, University Senate Council on Academic Freedom and Ethics	2002-03, 2003-04
Member, University Senate Ad hoc Bylaws Revisions Committee	2002-04
Chair, Ad hoc Committee on Administration-Governance Consultation	2003
Member, University Senate Governance Council	2004-05
Faculty member, SUNYA Peace & Justice	2003-2006
Founding faculty member, Campus Environment and Food Sustainability	2005-2007

Albany NY, Community Volunteer Service:

Member, Board of Directors, Capital District Community Gardens	**1999-2005**
Member, Solidarity Committee	1999-2009
Member, Capital District Alliance for Democracy	2000-2005
Member, NY Citizen Action	2000-2005
Member, Advisory Board, Occupational & Environmental Health Center	2005-2007

Selected Scholarly Activity:

Refereed Articles

Armstrong DL, Wing S, Tyroler HA: U.S. mortality from ill-defined causes, 1968-88: potential effects on heart disease mortality trends. International J Epid 1995;24(3):522-527.

Armstrong DL, Wing S, Tyroler HA: Race differences in estimates of sudden heart disease mortality, 1980-88: the impact of ill-defined death. J Clinical Epid 1996;49(11):1247-1251.

Armstrong DL, VanEenwyk J: Type of certifier and autopsy rates for sudden infant death syndrome-Washington state, 1980-1994. MMWR 1996;45(40):863-866.

Barnett EB, Strogatz D, **Armstrong DL**, Wing S. Urbanisation and coronary heart disease mortality among African Americans in the U.S. South. J Epid and Community Health 1996;50:252-257.

Wing S, Richardson D, **Armstrong DL**, Crawford-Brown D. A reevaluation of cancer incidence near the Three Mile Island nuclear plant: the collision of evidence and assumptions. Environmental Health Perspectives, 1997;105(1):2-7.

Wing S, Richardson D, **Armstrong DL**. Reply to comments on "A reevaluation of cancer incidence near the Three Mile Island" Environmental Health Perspectives, 1997;105(3):266-268.

Wing S, Richardson D, **Armstrong D**. Response: Science, public health, and objectivity: Research into

the accident at Three Mile Island. Environmental Health Perspectives 1997;105(6):567-570

Casper ML, Barnett EB, **Armstrong DL**, Giles WH, Blanton CJ. Social class and race disparities in premature stroke mortality among men in North Carolina. Annals of Epid. 1997;7:146-153.

Barnett EB, **Armstrong DL**, Casper ML. Social class and premature mortality among men: a method for state-based surveillance. AJPH 1997;87(9):1521-1524.

Armstrong DL, Barnett EB, Casper ML, Wing S. Community occupational structure, medical and economic resources, and coronary mortality among U.S. blacks and whites, 1980-88. Annals of Epid, 1998:8(3):184-191

Armstrong DL, Castorina J. Community occupational structure, basic services, and coronary mortality in Washington state, 1980-94. Annals of Epid, 1998:8(7):370-377

Armstrong DL. "Controversies in epidemiology," Teaching causality in context at the University at Albany, School of Public Health. Scandinavian J Public Health 1999:27(2):81-84

Barnett EB, **Armstrong DL**, Casper ML. Evidence of increasing coronary heart disease mortality among black men of lower social class. Annals of Epid 1999;9:464-471

Armstrong DL. A community diabetes education and gardening project to improve diabetes care in a Northwest American Indian tribe. Diabetes Educator 2000;26(1):113-120

Armstrong DL. A survey of community gardens in upstate New York: Implications for health promotion and community development. Health and Place 2000;6(4):319-327

Armstrong DL, Strogatz D, Wang R. Trends in coronary mortality and community services, associated with occupational structure in New York State, 1980-96. J Epidemiology and Community Health 2002;56:868-875.

Armstrong DL, Strogatz D, Barnett E, Wang R. Joint effects of social class and community occupational structure on coronary mortality among black men and white men, upstate NY, 1988-92. J Epidemiology and Community Health 2003;57:373-378.

Armstrong DL, Strogatz D, Wang R. United States coronary mortality trends and community services associated with occupational structure, among Blacks and Whites, 1984-98. Social Science and Medicine 2004;58(11):2349-2361

Armstrong DL, Strogatz D, Wang R. Joint Effects of Social Class and Community Occupational Structure on Coronary Mortality Among Black Men and White Men, in 20 U.S. States, 1988-92. Submitted for publication

Armstrong DL, Nampoothiri SE, Wang R, Strogatz D. Bus Transit Access to Medical Care, Grocery Stores and Jobs: A Transportation Equity Study in the Capital District of New York State, 2003. Ford Foundation final project report.

Book

Armstrong DL. Seducing Ourselves, Understanding Public Denial in a Declining Complex Society. 2014, published at Create Space, Amazon.com

Peer Reviewed Abstracts Presented at Scholarly Conferences

Occupational motor vehicle fatalities in North Carolina, 1979-88. American Public Health Association Annual Conference, Atlanta, November 1991.

The potential impact of ill-defined mortality on sudden CHD trends among U.S. blacks and whites, 1980-88. American Public Health Association Annual Conference, San Francisco, November 1993.

Unequal distribution of economic resources in U.S. counties and coronary mortality among blacks and whites, 1980-88. Presentation at the Centers for Disease Control and Prevention, Annual Epidemic Investigative Service (EIS) Conference, Atlanta, April 1996.

Subjective life satisfaction among American Indians with and without type II diabetes. American Public Health Association Annual Conference, New York, Nov. 1996

Level of county economic development and coronary mortality in Washington state, 1980-94. Poster presentation, American Public Health Association Annual Conference, New York, Nov. 1996.

Joint Effects of Social Class and Community Occupational Structure on Coronary Mortality Among Black Men and White Men, in 20 U.S. States, 1988-92. Society Epidemiologic Research, Toronto Canada, June 2005

Invited Presentations at Scholarly Meetings/Conferences

Race differences in U.S. ill-defined mortality: implications for CHD trends. Presentation at the National Institute of Occupational Safety and Health, Cincinnati, March 1993.

Community Capacity: What is it? How do we measure it? What is the role of the Prevention Centers and CDC?, Invited panel discussant for the Sixth Annual Prevention Centers Conference, Atlanta, February 1996.

Promoting Healthy Communities: Epidemiology and indicators of community health. Invited presentation at the Annual Meeting of the Council of State and Territorial Epidemiologist, Saratoga Springs NY, June 1997.

''Controversies in Epidemiology' teaching causality in context at the SUNY, School of Public Health.' Invited presentation at the American Public Health Association Annual Conference, Indianapolis, Nov. 1997.

'Funding for Participatory Research in Public Health.' I/nvited presentation at a conference entitled 'A Focus Group Meeting on Action Research as a Means to Support University and Community Partnerships,' (PI: Dr. Shirley Jones, Distinguished Service Professor, School of Social Welfare), sponsored by University at Albany, Cornell University, New York African-American Research Foundation, Oct. 1998.

'Social Class and Premature Heart Disease.' Invited keynote presentation of the Chronic Diseases Section: Northeast Epidemiology Meeting, Council of State and Territorial Epidemiologist, Maine, Oct. 1999

'A focus group meeting on research as a means to engage, enrich and sustain communities (International interdisciplinary approach).' Invited participant and Co-Coordinator of a teleconference with South Africa, organized by Dr. Shirley Jones (Distinguished Service Professor), July 2000.

'A community based index of inequality.' Invited participant of a workshop/discussion, organized by Dr. John Lynch, University of Michigan, SPH, August 2000.

'Healthy Cities' a revolutionary perspective. Presentation at Rensselaer Polytechnic Institute. Apr 2002.

A Food Forest Demonstration Garden In Purcell Park, With Improved Flood Control

A Permaculture Design by Donna Armstrong

November 12, 2018

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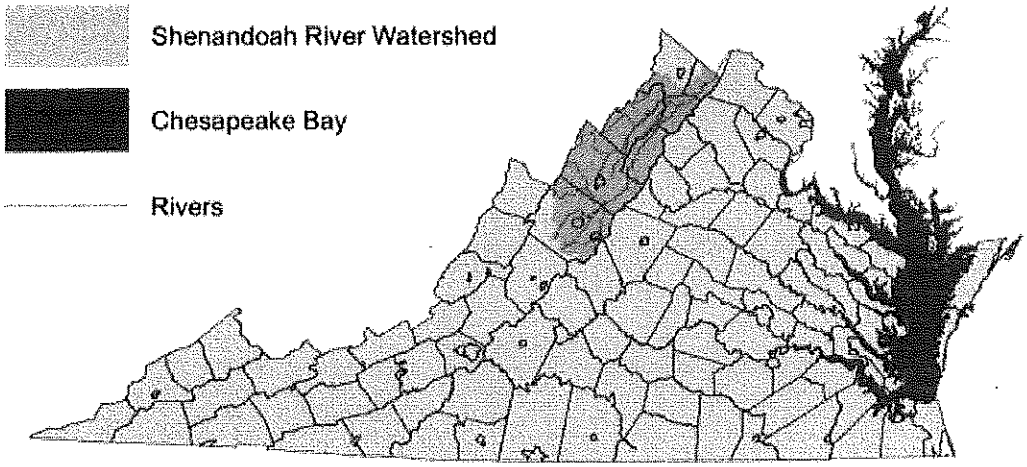
A Food Forest Demonstration Garden In Purcell Park, With Improved Flood Control

A Permaculture Design by Donna Armstrong

Purcell Park is a 67 acre park, which is one of two city parks located in Harrisonburg Virginia. The park has three softball/baseball fields, four tennis courts, a playground, three picnic shelters, several restrooms, and a 1.5 mile walking trail. A large portion of the Bluestone Trail also runs through the park. The Bluestone Trail is a 1-mile shared-use path that connects people between James Madison University; Port Republic Road and Hillside Avenue; Purcell Park and the surrounding neighborhood; and businesses along Stone Spring Road. The shared-use Bluestone path is 10-feet wide, hard surfaced, and is used by many walkers, joggers, and bicyclists for transportation and recreation, especially for accessing the JMU campus. This path, with significant daily foot and bicycle traffic, runs in front of the hillside that will be the Food Forest Demonstration Project in Purcell Park (shown below).

In addition to recreation, Purcell Park serves as important flood control for the Blacks Run Creek, which runs through Harrisonburg city and then South through Purcell Park. The following map shows the Shenandoah Watershed.



Chesapeake Bay Watershed

The Shenandoah River eventually flows into the Potomac River and later the Chesapeake Bay. Therefore, all sub-watersheds in Shenandoah River impact the Chesapeake Bay. The Chesapeake Bay is on the impaired waters list due to too much nitrogen, phosphorus, and sediment. The US Environmental Protection Agency (US EPA) established the Chesapeake Bay Total Maximum Daily Load (TMDL), which is a comprehensive "pollution diet" with rigorous accountability measures to restore clean water in the Chesapeake Bay and the region's streams, creeks, and rivers.

The City of Harrisonburg is 17.6 square miles (approx. 11,500 acres), and highly urbanized with substantial impervious surfaces. Harrisonburg drains into six different subwatersheds. Ultimately, all of these watersheds drain into the Shenandoah River and the Chesapeake Bay.

The table below outlines the impairments of each subwatershed.

Subwatershed Name	**Hydrologic Unit Code (HUC) External Links icon**	**Approximately Length (miles) within Harrisonburg**	**Approximate Drainage Area (Acres) within Harrisonburg**	**Impairments**
Blacks Run (flows into Cooks Creek)	PS22	8.67	9067	*E. coli, Fecal* Coliform, General Benthics
Sunset Heights Branch of Cooks Creek	PS23	2.09	2.09	*E. coli*
Dry Fork (flows into Smith Creek)	PS59	0.206	493	*E. coli,* Sediment
North River-Mill Creek	PS26	No Stream	87.44	No outfalls
Cub Run (flows into South Fork of the Shenandoah River)	PS33	No Stream	14.75	No outfalls
Linville Creek (flows into North Fork of the Shenandoah River)	PS56	0.08	117.8	*E. coli,* Sediment

Green Infrastructure in Parks

Green infrastructure can help to maximize the environmental, economic, and social benefits of parks. An excerpt on the value of green infrastructure in parks, from an EPA report on this topic, is the following (https://www.epa.gov/nps/green-infrastructure-parks-guide):

Green Infrastructure in Parks:

Enhances Recreation Value
Green infrastructure can be used to create or enhance amenities in parks. For example, hiking or biking trails can be built incorporating green infrastructure. Restoration of degraded areas can provide wildlife habitat and viewing areas and opportunities for outdoor education. Green infrastructure practices can be designed to reduce pollutants discharged into waterbodies and reduce the threat of illness from recreational contact due to wading, swimming, or boating. Buried streams and springs can be unearthed and restored to provide interactive water features such as wetlands, ponds, and creeks for public use. Natural drainage ways and infiltration practices can be used to help maintain adequate flows to these waterbodies.

Creates Attractive Park Features
Green infrastructure practices designed to infiltrate runoff, can include a diverse palette of native plants and locally adapted plants of many textures and colors. These bioretention areas can be designed with pathways and benches for public enjoyment and planted to attract beneficial wildlife such as butterflies or other pollinators. Drainage and infiltration areas can be designed to enhance the topography of the park and provide picnicking and play areas, as well as visual or physical barriers to create special areas for meditation or wildlife viewing. Trees, shrubs, and ornamental grasses, in addition to being visual amenities, can be used to reduce noise and cut-throughs.

Enhances Social and Environmental Equity
Green infrastructure can be used to enhance public wellbeing in underserved or underprivileged communities. These communities often lack adequate park access and facilities. Newly created and rehabilitated parks can enhance the health of local residents by providing opportunities for physical activity, interactions with nature, and destination community gathering places.

Reduces Maintenance
Green infrastructure can be used to help reduce maintenance at parks. Stormwater utility funds can be used to improve drainage, reduce erosion, and eliminate standing water. The health of vegetation can be improved through better drainage and the maintenance burden can be reduced. Good drainage systems that promote infiltration or overland flow can help reduce mosquito breeding habitat and disperse water over a larger vegetated area and potentially reduce irrigation needs. Converting high maintenance vegetation (such as turf) to lower maintenance native vegetation can

reduce the need for supplemental water and other inputs such as fertilizers and pesticides. Mowing and weeding frequency might also be reduced. Green infrastructure areas can help reduce problems caused by high runoff or sedimentation of streams.

Provides Economic Benefits
Green infrastructure can be installed to earn stormwater utility credits in stormwater fee areas, and the parks could receive funds from such programs. Parks with green infrastructure might be able to apply for maintenance funding or have their best management practices (BMPs) maintained by an outside party, depending on the type of BMPs and the types of approaches taken by the local municipality. Where rainwater harvesting has been incorporated, captured water can be used for irrigation or other graywater uses, reducing costs associated with potable or recycled water use. Upgraded stormwater management systems could also reduce maintenance costs or reduce capital costs to upgrade essential stormwater management infrastructure. Destination parks could also stimulate community-level investments due to the desirability of being near the park.

Improves Drainage
Permeable pavement, soil amendments, enhanced infiltration, and underground stormwater storage systems can be used to mitigate drainage problems or nuisance flooding in parking areas, walkways, and playing fields. Urban soils are often compacted and hard to maintain. Improving the drainage of turf fields can result in fewer field closures after rain storms and reduce the need for seasonal turf maintenance, re-tilling, and aeration. Addressing issues of standing water on pavement or in low lying areas improves public safety and helps to eliminate mosquito breeding habitat.

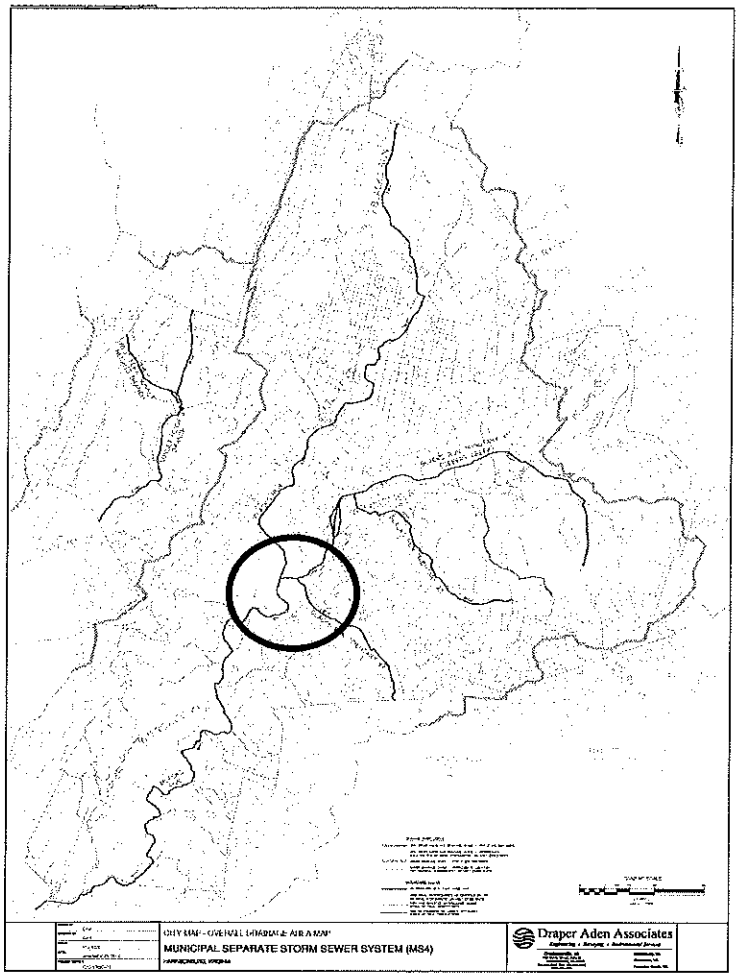
Helps to Educate the Public
Placing signs where green infrastructure is used raises public awareness of the importance and type of measures that reduce stormwater pollution. Green infrastructure at parks can demonstrate features easily transferrable to homes and businesses. Green infrastructure demonstrations and signage can help the local municipality meet stormwater program requirements for public education. Maintenance of green infrastructure can also help create green jobs and educate the new green work force.

Improves Water Quality
Stormwater volume and pollutant reductions can be achieved with green infrastructure to help local municipalities meet regulatory requirements. Park spaces offer a wealth of pervious surface that can be used to absorb rainwater and runoff from adjacent developed landscapes that currently drain directly to piped collection systems.

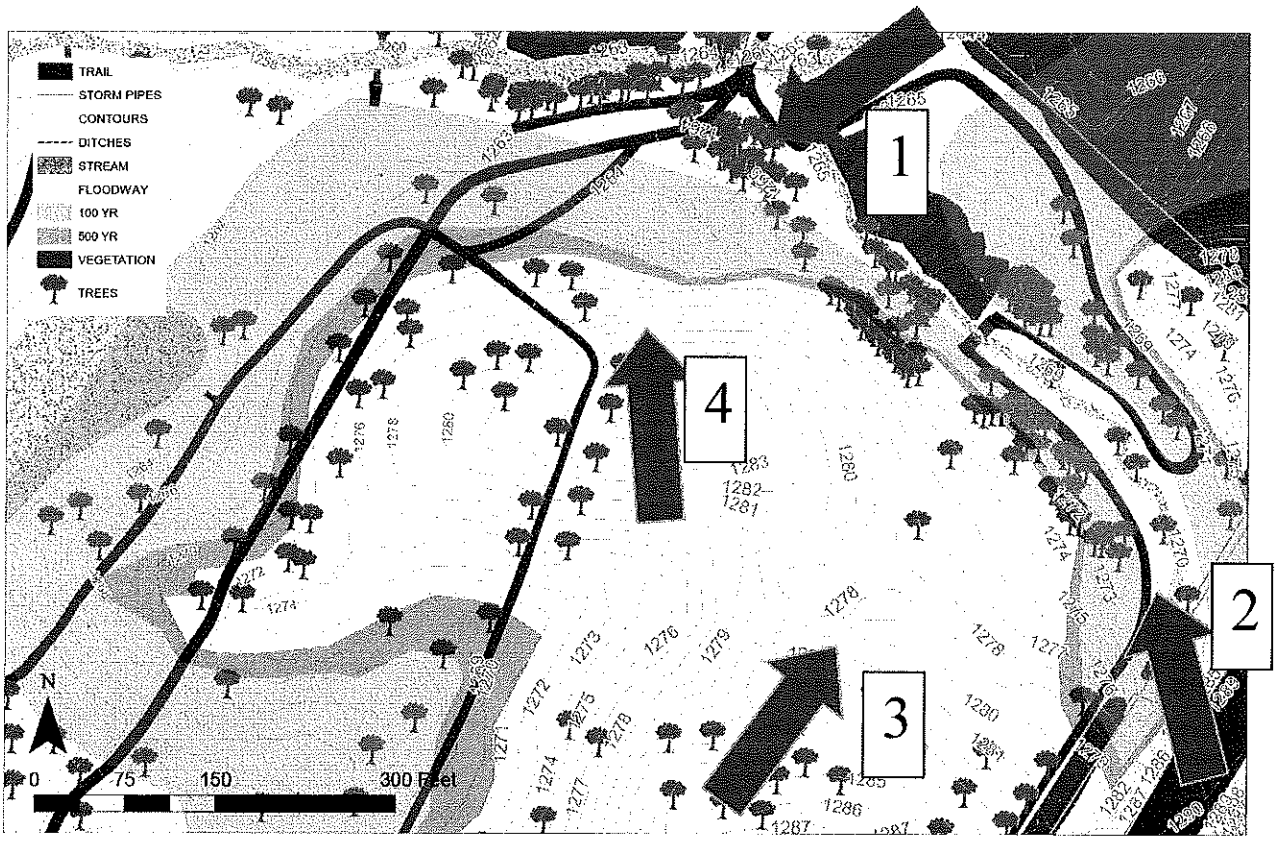
Benefits the Overall Environment

Green infrastructure can be used to reduce urban heat island impacts by incorporating vegetation, especially trees, where pavement or conventional turf landscapes existed before. Vegetated green infrastructure can also sequester carbon via CO2 uptake during photosynthesis, which traps carbon in the biomass and helps reduce greenhouse gases. Green infrastructure planted with native and locally adapted plants can attract beneficial wildlife such as birds, butterflies, and other pollinators.

Figure (below) shows Blacks Run Creek tributaries in Harrisonburg, converging in Purcell Park (shown in the black circle). This is the area that is proposed for a permaculture Food Forest and greatly improved flood control project.



The illustration shown below depicts the same site shown in the above map, and adds specific sources of flooding from four directions. 1) Blacks Run Creek moving south from Harrisonburg downtown 2) Blacks Run Creek tributary coming underneath I81, from built areas with significant impermeable surfaces 3) Purcell Park runoff from grassy elevations 4) Purcell Park runoff from grassy elevations. Wide turquoise blue swaths on the map show 100 year flood plains, which recently have been routinely flooding within 1-2 years.

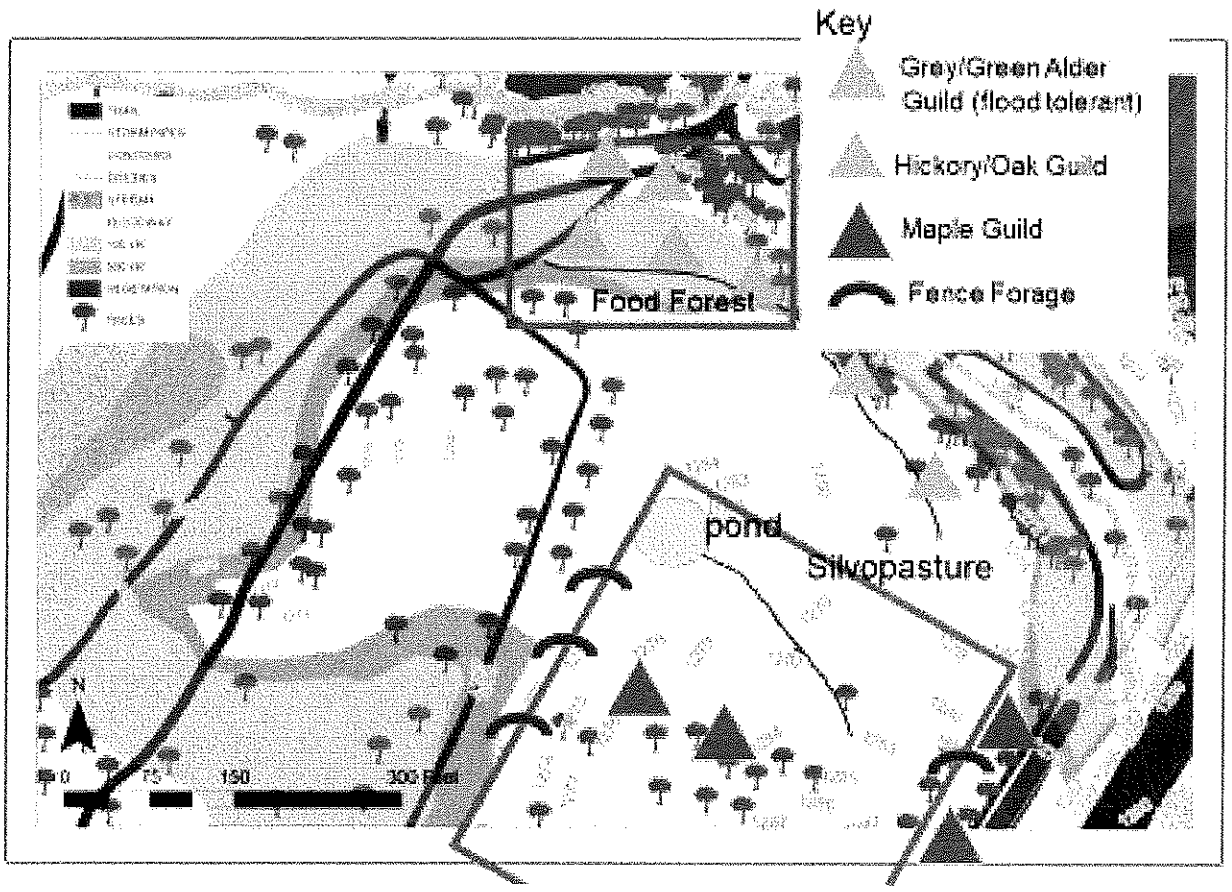


Permaculture Project Design

Two Main Project Design Goals

This project has two main goals (shown in the following figure). The **first goal** is the development of a demonstration Food Forest. This area is approximately 5 acres in size (green box). The **second goal** is to develop the area on a long hill above and contiguous with the Food Forest to reduce flooding of Blacks Run Creek tributary and install a pollinator garden sitting area (purple box). This area is approximately an additional 4-5 acres.

Overall Project Design



The client for this project is the City of Harrisonburg, Parks and Recreation Department.

Current Site Uses:

1. Flood plain for Blacks Run Creek
2. Popular city park: game fields, walking paths, fishing
3. Dog walking park
4. Open space, animal habitat protection
5. Provides a section of the Bluestone Trail, which connects JMU campus and apartment buildings to the South-West of the Purcell Park

Primary Client Priorities/Concerns:

1. Maintain and improve park recreational attractions
2. Minimize/conserve park labor and financial maintenance costs
3. Maintain and improve watershed/flood needs

List of Client Goals:

1. Improve flood management for Blacks Run Creek, tributaries and other park sources
    a. Retain and slow water flows on the Purcell Park site
    b. Prevent erosion
    c. Build soil fertility
    d. Improve creek ecosystems
    e. Reduce flooding related costs (e.g. rebuilding paths from repeated flooding)

2. Encourage/support locally, urban grown food
3. Demonstrate a Food Forest and educate the public about perennial forest food growing
4. Enhance wildlife habitat, butterfly and bee forage
5. Enhance usefulness and productivity of park lands, reduce inputs/costs

Project Design Implementation:

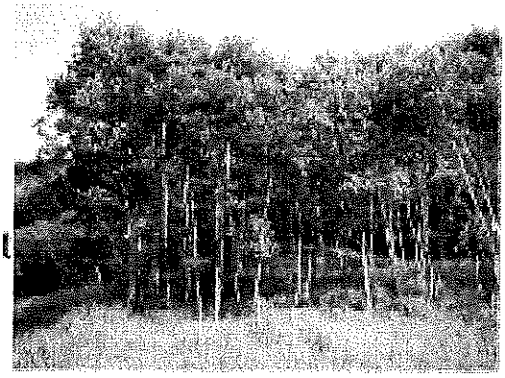
Swales construction

To address the problem of water runoff from grassy elevations (shown by #4 and #3 in the figure above), two swales are proposed, one of which will drain into a wet garden area. The upper swale drains into a depressed location shown by the circle on the Figure. This upper swale is cut on contour, but drops gradually from elevation 1285 down to elevation 1279, to feed the proposed pollinator garden area. The lower and longer swale extends from the Food Forest site to below the far end of the upper swale. The lower swale also roughly parallels the Blacks Run creek tributary at the bottom of the hill.

The proposed pollinator garden location has not been soil tested, but preliminary soil examination shows good water absorption even following heavy rainfall. This depressed location, with water fed from the upper swale would provide an ideal wet garden/pollinator garden sitting site.

The lower area of the proposed Food Forest site floods often and typically has wet soil, but is not swampy or marshy soil. Therefore, the project proposes to plant this area in flood tolerant trees and plants that prefer wet soil. Grey and green alder trees (Birch family) and guild compatibles are proposed for this area. This area is north facing but has westerly, afternoon sun exposure and good wind protection.

- Grey/Green Alder Trees (flood, wet soil tolerant; pH 3.4-7.4; Zone 2-6; Sun/shade/partial sun)



Value: erosion control, wildlife food/habitat, nitrogen fixer, medicinal

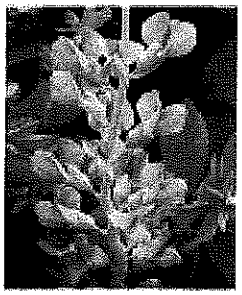
- Guild Compatibles: hazelnut, white willow, red twig dogwood, river bulrush, mountain mint, butterfly milkweed

Grown under/around trees, sun/shade tolerant, about 2'-4' multiple benefits

Ex. Blue (false) Indigo, Currants, Elderberry, Comfrey

goals: **Bee forage, beauty, soil building, prevent erosion, food source, medicinal**

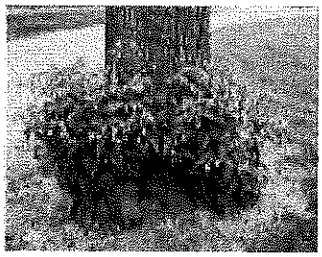
Blue Indigo



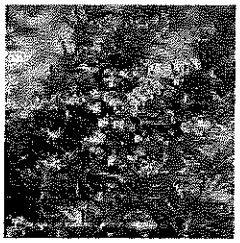
Black Currants

Elderberry

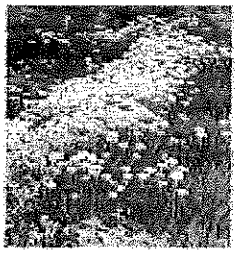
Comfrey



Rosemary

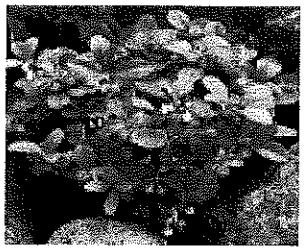


Chive

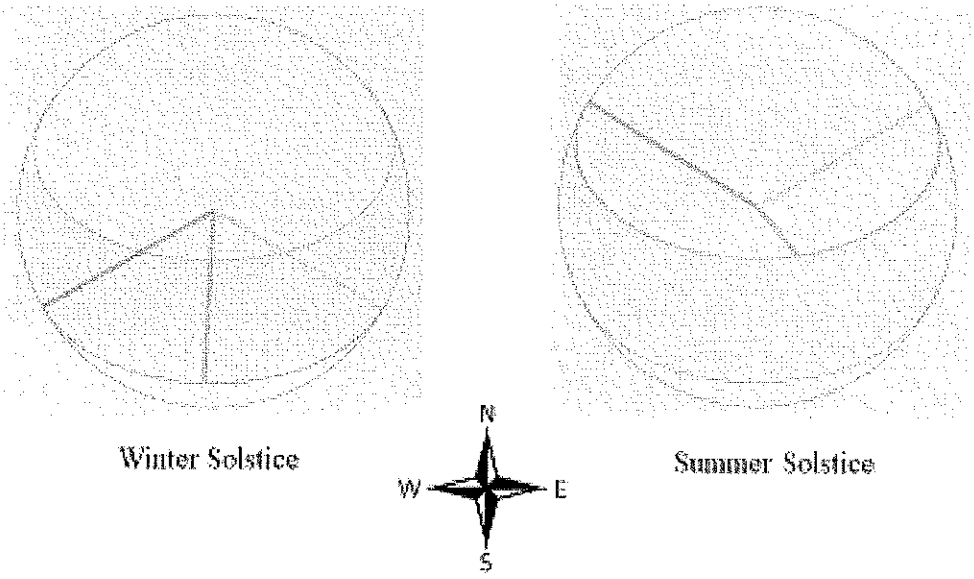


Thyme

Wintergreen



Solar Aspect: Winter and Summer Solstices

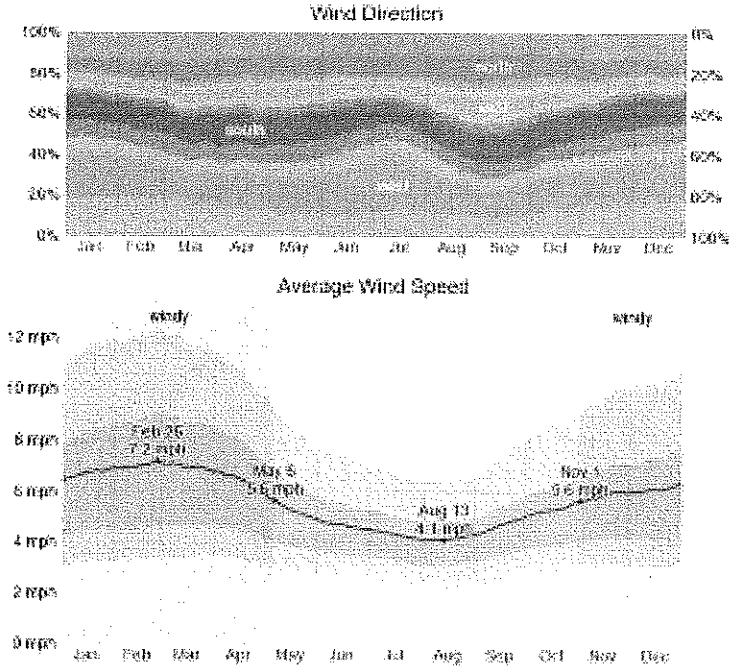


Winter Solstice

Summer Solstice

Sun positions at sunrise (yellow) and sunset (red).

Wind Direction and Speed

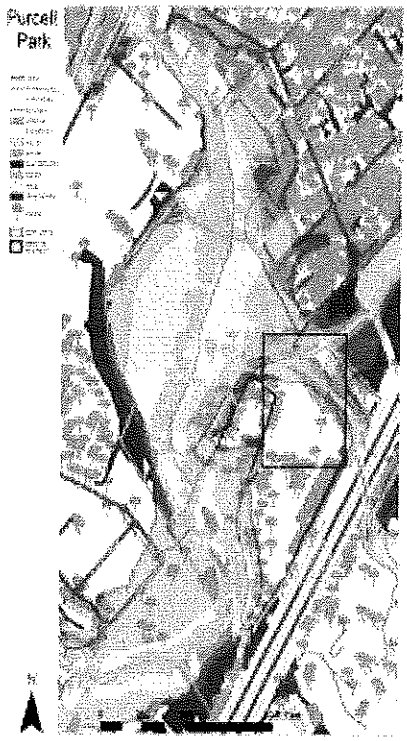


The average of most hourly wind speeds (dark gray line) with 25th to 75th and 10th to 90th percentile bands.

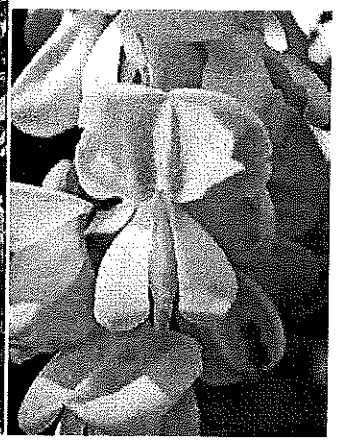
Demonstration Food Forest and Public Education

A swale will be constructed along the contour, mid-way up the elevation of the hill (shown in the picture below), and following the contour along the length of the creek toward I81. Hickory and oak guilds will be planted along this swale. The hickory-oak guild will include options such as the following for over-story trees: white/red/black oaks, pignut, bitternut, shagbark hickory, other hickory types, and pecan. Under-story trees will include persimmon, hazelnut, apple tree, paw-paw, and pear tree. These trees include food and medicinal sources for humans; provide wildlife food and habitat; and provide bee forage. Also, black locust will be planted as a nitrogen-fixer, bee forage, and for the usefulness of its wood and quick growth. Additional food forest shrubs and plants, compatible with oak-hickory guild, are raspberries, blackberries, blueberries, elder berry, josta berry, currants, grape vines, witch hazel, wild ginger, and nettles.

Purcell Park Food Forest Garden (red box)



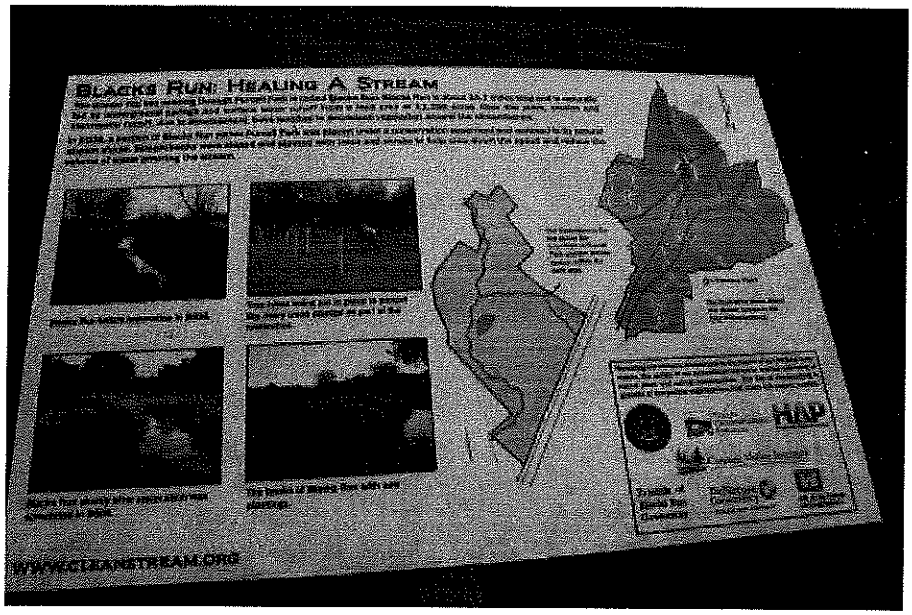
Shagbark Hickory

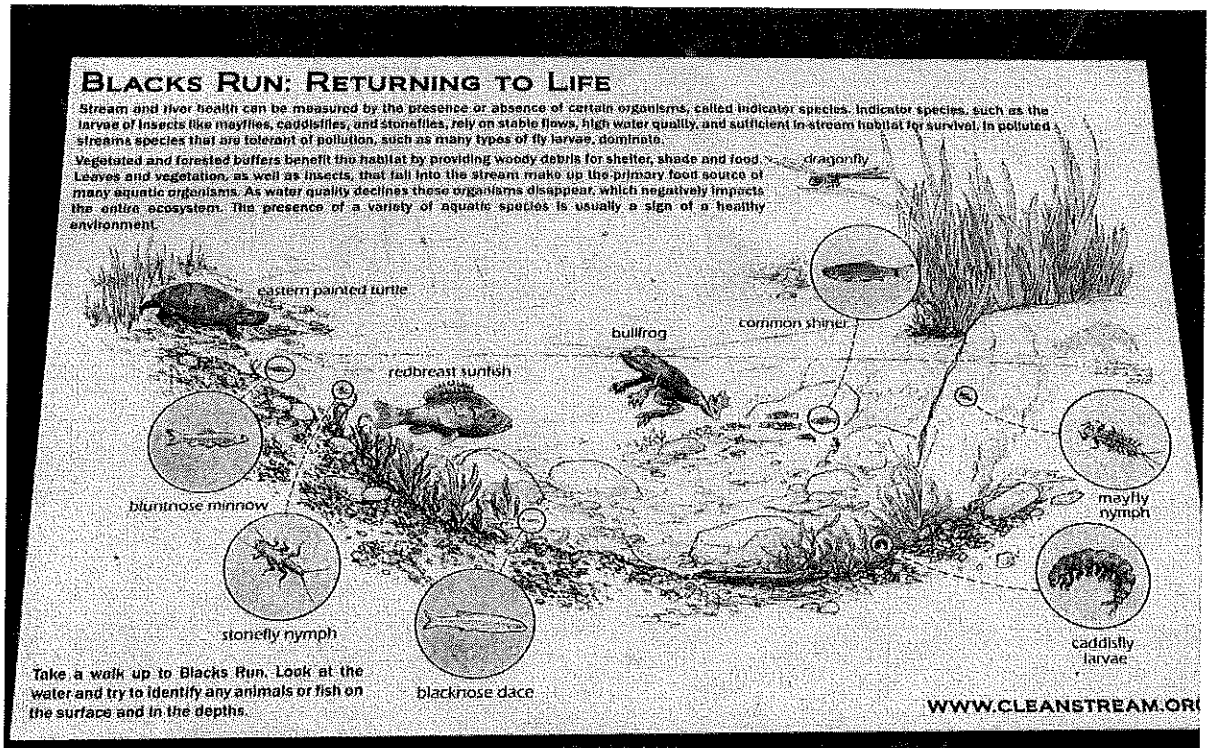


Black Locust

Public Education Signage: Demonstration Perennial Food Forest

There is a high-traffic pedestrian path, part of the Bluestone Path, which passes in front of the Demonstration Food Forest. This provides an ideal location for installing educational signs, which are used in other areas of Purcell Park (examples below).

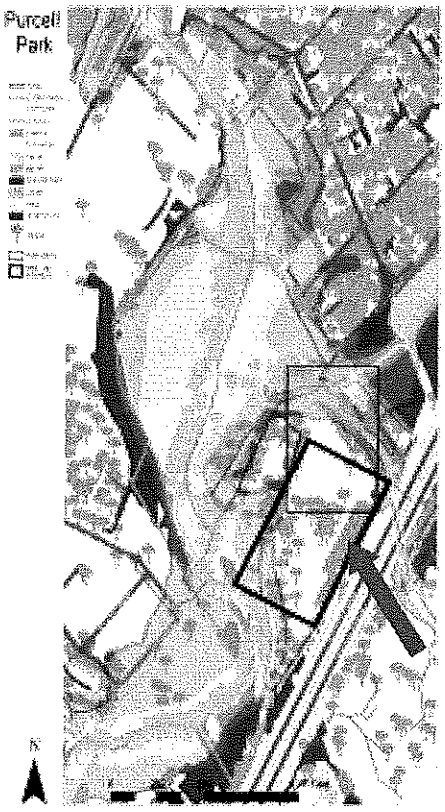



BLACKS RUN: RETURNING TO LIFE
Stream and river health can be measured by the presence or absence of certain organisms, called indicator species. Indicator species, such as the larvae of insects like mayflies, caddisflies, and stoneflies, rely on stable flows, high water quality, and sufficient in-stream habitat for survival. In polluted streams species that are tolerant of pollution, such as many types of fly larvae, dominate.
Vegetated and forested buffers benefit the habitat by providing woody debris for shelter, shade and food. Leaves and vegetation, as well as insects, that fall into the stream make up the primary food source of many aquatic organisms. As water quality declines these organisms disappear, which negatively impacts the entire ecosystem. The presence of a variety of aquatic species is usually a sign of a healthy environment.
dragonfly
eastern painted turtle
bullfrog
common shiner
redbreast sunfish
blunthose minnow
mayfly nymph
stonefly nymph
caddisfly larvae
blacknose dace
Take a walk up to Blacks Run. Look at the water and try to identify any animals or fish on the surface and in the depths.
WWW.CLEANSTREAM.OR

Silvopasture/Pollinator Garden Sitting Area

The term Silvopasture has been used by USDA professionals to mean "a form of agroforestry defined by the intentional integration of a system of symbiotic, planned interactions that produces wood, forage and livestock products while simultaneously creating sustainable environmental benefits and ecosystem services."

Silvopasture location (dark blue box)



This project area (shown in the dark blue box) is parallel to one of the park walkways, which extends up a long slightly inclined area, and which has been planted with a long row of maple trees (shown by the green arrow). This original park design of long rows of established over-story trees, with open grass in between, lends itself to adaptation that is suitable for silvopasture.

There are mainly maple trees currently in the area, with mowed grass surrounding each tree, which requires high-maintenance. These maples will be developed into maple guilds, including forage shrubs and small trees (e.g. black locust, hazelnut, apple). This area for the current proposed project is approximately 5 acres and will benefit from maple tree guild development in the following ways: improved walking path shade, greatly improved natural aesthetics (similar to JMU Arboretum paths), improved soil, reduced mowing, increased pollinator forage, increased wildlife habitat, increased human food production (e.g. hazel

nuts, apple, pear, raspberries). This pasture area is designed to be productive at multiple trophic levels (heights) and a maximum benefit is obtained from this permaculture approach.

The lower depressed area (shown as "pond") on the map will receive water runoff from the swale shown at the bottom end of this pasture area. This depressed area is not suitable for a pond (too little clay/excellent growing soil instead) but will alternatively serve well to provide a water sink for runoff from the long pasture hillside above. This will eliminate this added flood source for the Blacks Run Creek tributary at the bottom of this hill. This area will make a lovely sitting area and the extra water from the swale will help maintain a wild pollinator sitting garden, and ideal educational signage location.

Collaborative Community Relationships

The Client for this project is a governmental department of the City of Harrisonburg VA. The project was developed initially with assistance from staff in the GIS program in the Department of Community Development. This department provided significant encouragement and material assistance with mapping and information about Purcell Park. During this period of initial project mapping and conceptualizing, a new GIS support staff-person began working at Parks and Rec. This project was then appropriately referred to Parks and Recreation, which has been helpful by offering additional technical support for this project.

A primary guiding rule for developing community collaborative relationships is to understand and respect institutional culture and roles, across different types of organizations. Developing collaborations by finding overlapping priorities of different institutions and then developing partnerships based on those organic shared overlapping priorities, must start with understanding the individual organizational cultures and respecting differences in the agendas of different organizations.

It is premature to analyze budget needs for project implementation, since the client is part of a city government, namely Department of Parks and Recreation, may provide, for example, heavy equipment and labor support for implementation at a lower cost than would be available through private contracting for these services. Also, there are other community organizations, notably the community organization called Vine and Fig, which has significant technical expertise in agroforestry, many local contacts for plant/tree sourcing, and also has community resources for volunteer labor. Furthermore, this proposed Purcell Park project is closely aligned with the organizational goals of the Vine and Fig community organization. Development of this collaboration would be highly advantages to this project.

The EPA program on adding green infrastructure into parks, describes the following process for project development and collaborative relationships:

> Adding green infrastructure in a park is a multi-step process that involves a variety of stakeholders. The first phase of any project involves identifying partners. Engaging with partners from the outset of the project will ensure that the necessary expertise is

available to guide the project from an idea through its implementation. The second phase includes relationship building, leveraging funds, identifying which green infrastructure practices to use, and planning for maintenance. Selection of high-visibility pilot projects can draw attention to the work being undertaken and encourage community support.

This project has great promise as a pilot demonstration project. It involves multiple overlapping goals of local (urban) food development, creek ecosystem recovery, flooding and climate change adaptation, support for pollinator systems, improved natural park-recreational benefits, and more. This project could serve as a highly innovative model pilot project for many cities in Virginia and in the United States.