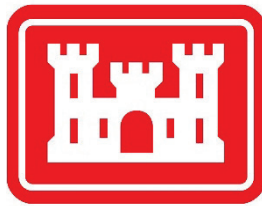


Appendix K: Recreation

Valley Creek Flood Risk Management Study

Fiscal Years: 2018-2021

**U.S. Army Corps of Engineers
Kansas City and Mobile Districts
Engineering Division**



**Valley Creek Basin
Jefferson County, Alabama**



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1.0. INTRODUCTION

Recreation features are an ancillary objective of Corps projects; they may be included, to a limited degree, in the context of a larger project for flood risk management. Features and uses studied and proposed for this project would fit within relevant Corps policies (ER 1105-2-100 and EP-1165-2-1), including:

- Features and use would be compatible with and have no impact to the flood risk management measures.
- Recreation use would be day use only.
- Features would be of basic or modest construction design, but durable.
- Recreation features would add no real estate requirements to the project beyond the detention areas. Any parking lots would be outside the flood risk management detention areas and are not included in project costs.
- Benefit/Cost Ratios would be greater than 1.0 for each detention area
- Recreation measures would be cost-shared 50-50 with the nonfederal sponsor.
- The Federal share of recreation cost would increase total Federal costs less than 1 percent of the project cost.

Specific guidance for recreation projects and the incidental benefits for recreation projects are provided in ER1105-2-100 Appendix E, Section VII. The Corps can plan for and implement projects serving other purposes, which may have incidental recreation benefits. Benefits are incidental when: (1) a project is formulated for other primary purposes and recreation benefits are less than 50% of total benefits, or (2) a project is formulated for other primary purposes and average annual recreation benefits are less than 50% of the average annual benefits required for justification. There may be additional recreation benefits if they are not required for justification. In this case, recreation cost sharing requirement is fifty percent. (ER 1105-2-100, Appendix E, Section VII, E-47, page E-179)

The purpose of the Recreation Appendix is to describe the existing recreation conditions of the study area, future conditions without and with the proposed recreation trails and amenities, and the economic evaluation completed on the proposed recreation trails and amenities. The following section describes the existing recreation conditions for the study area in general; it is followed by a discussion of future conditions, and an evaluation of the proposed recreation facilities.

2.0. EXISTING CONDITIONS

The study area includes the western portion of the City of Birmingham, Fairfield, Midfield, Brighton, Liscomb, Hueytown, and Bessemer. The study area is depicted in Figure 1. Table 1 shows the population for the communities in the study area in 2000, 2010 and 2017, including rates of change in population. Although the state of Alabama has experienced small increases in population growth over the past two decades, communities in the study area have experienced decreases in population (Table 1). Populations in the communities in the study area have lower household incomes than those across Jefferson County and the state, and higher concentrations of people living below the poverty level (see Socioeconomics Existing Conditions section).

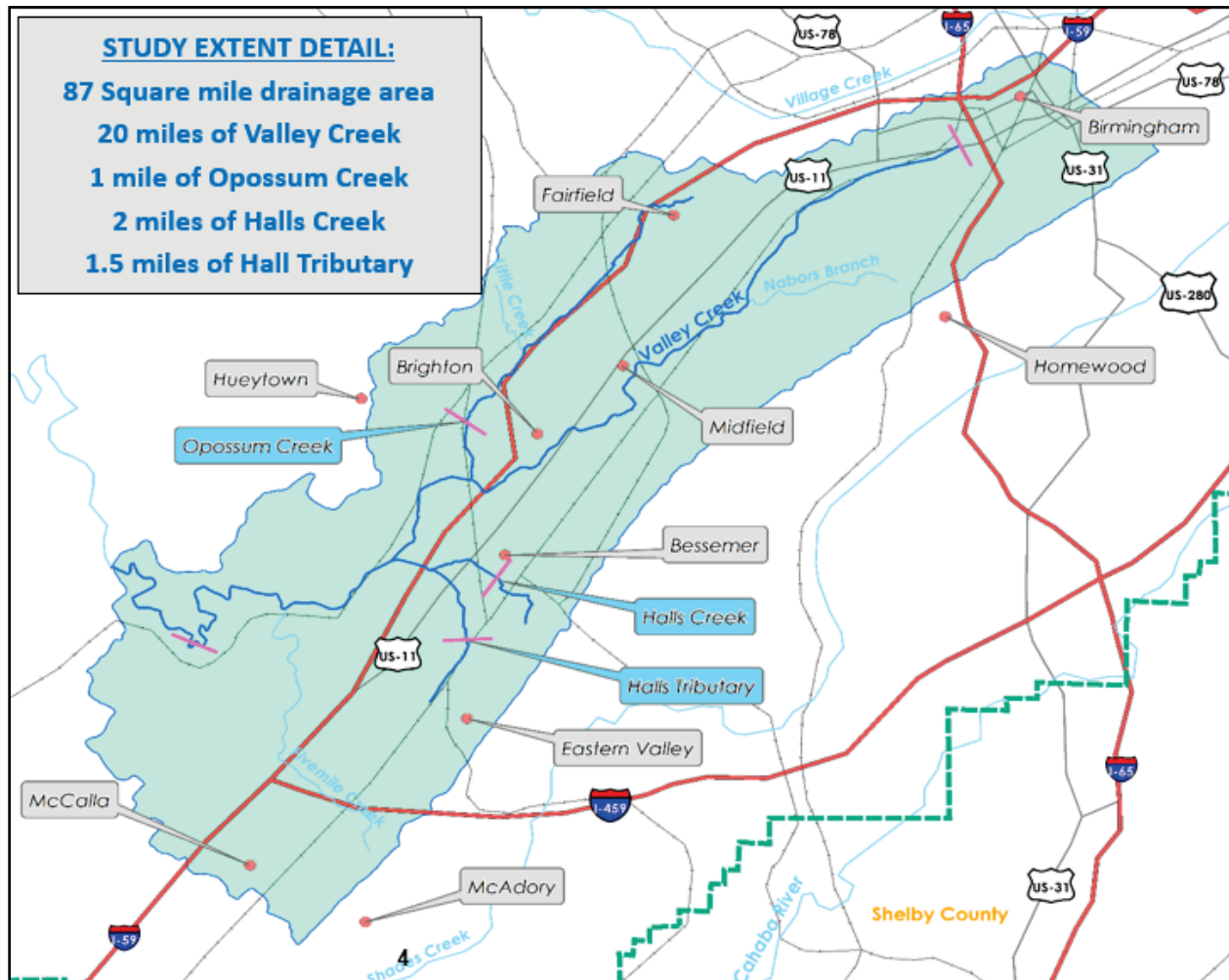


Figure 1. Project Study Area.

Table 1. Population in the Study Area Communities, Jefferson County, and Alabama

Area	2000	2010	2017	% Change 2000-2010	% Change 2010-2017	% Change 2000-2017
Alabama	4,447,100	4,779,736	4,850,771	7.0%	1.5%	8.3%
Jefferson County	662,047	658,466	659,460	-0.5%	0.2%	-0.4%
Birmingham	242,820	212,237	212,265	-14.4%	0.0%	-14.4%
Bessemer	29,672	27,456	26,697	-8.1%	-2.8%	-11.1%

Area	2000	2010	2017	% Change 2000-2010	% Change 2010-2017	% Change 2000-2017
Brighton	3,640	2,645	2,848	-37.6%	7.1%	-27.8%
Hueytown	15,364	16,105	15,698	4.6%	-2.6%	2.1%
Lipscomb	2,458	2,210	2,040	-11.2%	-8.3%	-20.5%
Midfield	5,626	5,364	5,174	-4.9%	-3.7%	-8.7%

Source: U.S. Census Bureau 2017. American Community Survey.

Only the western portion of Birmingham is in the study area. To assess the population that could be affected by the project, the U.S. Census Block Group data was obtained for the physical boundaries of Valley Creek study area. Interstates and physical geography were considered as well as the layout of planned and existing trail corridors associated with the Valley Creek alignment. For example, the boundary would exclude U.S. Census Block Groups that were on the other side of the highway. For the US Census Block Groups shown in Figure 2, the population is estimated to be 95, 716 (US Census, 2017).

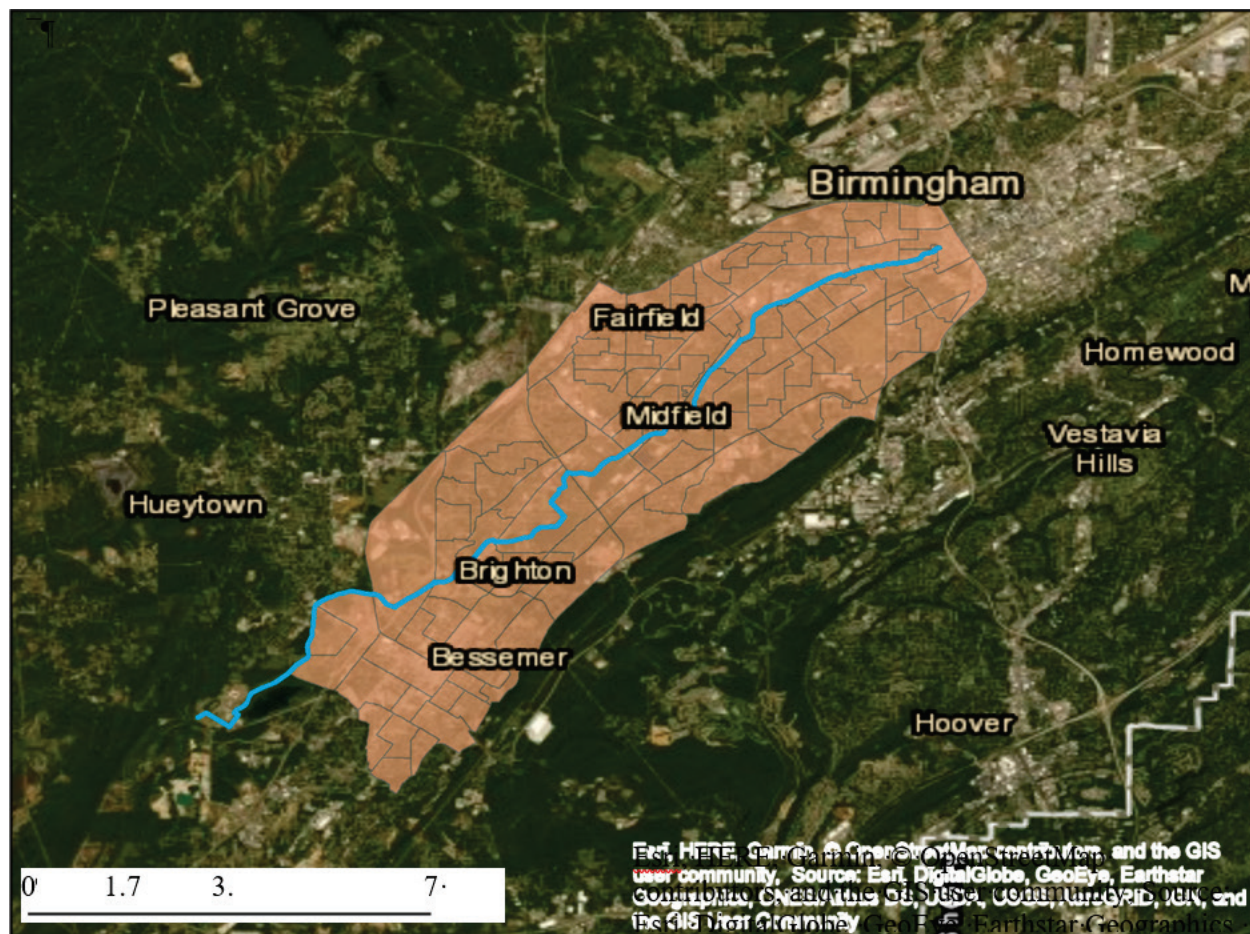


Figure 2. US Census Block Groups associated with the Valley Creek Project Study Area.

Several trails run through the study area, including The High Ore Trail, MLK Jr. Drive Greenway, Greenspring Avenue Trail Sharrows (roads that share bicycle and automotive lanes), Jones Valley Trail, and Bessemer Rail Trail. Red Mountain Park is located just outside the study area, southeast of Midfield. Some of the trails are greenways, multi-use pathways adjacent to roads, while others are former railroad grades that have been converted to trails and pathways. Freshwater Land Trust and Jefferson County have partnered to develop trails, greenways, rail trails, and other pathways in the greater Birmingham area and

in Jefferson County. As part of the Red Rock Ridge and Valley Trail System Plan (Red Rock Plan), one of the trail corridors is the Jones Valley Corridor, which is drained by Valley Creek (see Figure 3).

Based on surveys conducted in 2017 and data collected from partnering agencies, current Red Rock trail usership in the Jones Valley Corridor, which includes several trails outside the Valley Creek project study area is approximately 904,000 users annually (Freshwater Land Trust, 2019). The High Ore Trail is estimated to have 13,100 users annually, while the Bessemer Rail Trail is estimated to have 48,000 annually. Red Mountain Park, while outside of the study area, is likely the longest trail system near the project, with an estimated 138,000 annual users. Red Mountain Park provides 15 miles of hiking and mountain biking trails and 2 miles of flat walking trails.

3.0. FUTURE WITHOUT-PROJECT CONDITIONS

The study area includes several future and planned trails. The Jones Valley Corridor is one of seven trail corridors described in the Red Rock Plan. The Jones Valley Corridor follows the Jones Valley from Bessemer in the west to East Lake Park near Ruffner Mountain in the east. Jones Valley is drained by Valley Creek along which most of the corridor is located. Figure 3 shows the Jones Valley Corridor from the Red Rock Plan (Jefferson County and Freshwater Land Trust, 2010). It should be noted that in the Red Rock Plan, Jones Valley Corridor includes trails along the corridor alignment shown in Figure 3, but also includes trails near this trail alignment.

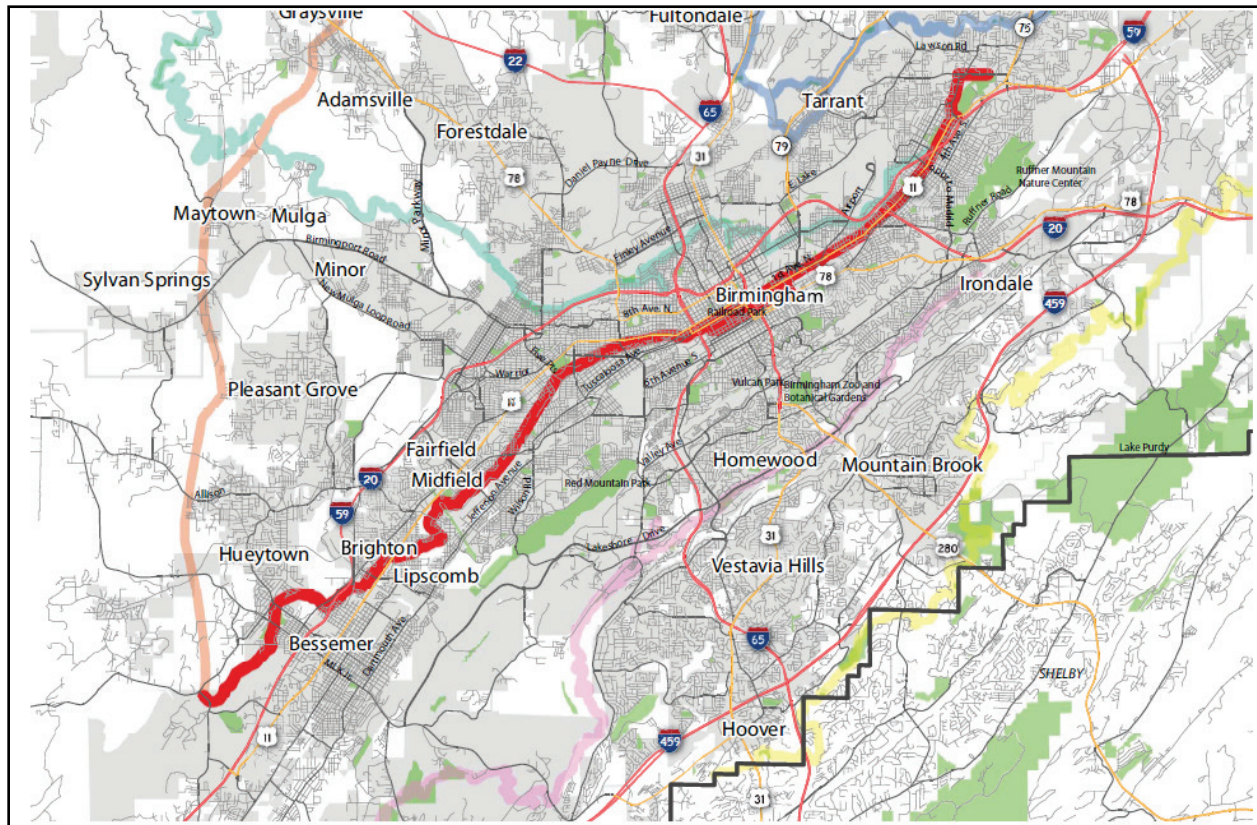


Figure 3. Jones Valley Corridor. Source: *The Red Rock Ridge and Valley Trail System Plan.*

One of the priority trails for development in 2020 identified by the Freshwater Land Trust is along Valley Creek within the Jones Valley Corridor, connecting the existing High Ore Trail eastward to the Birmingham CrossPlex. In Figure 4, this proposed trail is shown as a blue dashed line within the highlighted area. The Birmingham CrossPlex is located in West Birmingham approximately 5 miles west of downtown Birmingham. The trail development along the Jones Valley Corridor/Valley Creek from the Birmingham CrossPlex to downtown Birmingham (not identified as a priority in 2020) would likely occur as a rail greenway, although the rail line is still in use. Therefore, its development is likely to occur in the future (Freshwater Land Trust, 2020).

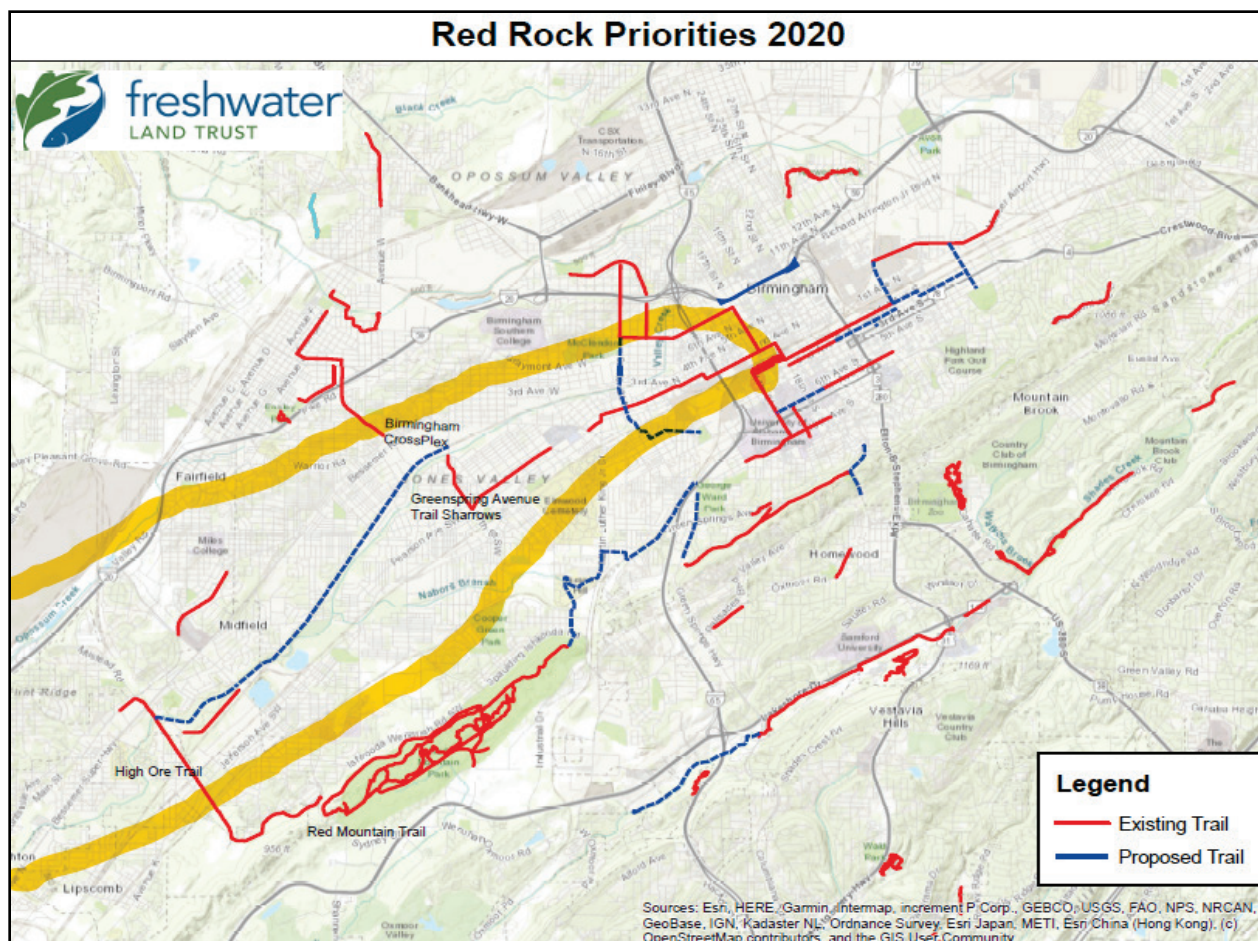


Figure 4. Freshwater Land Trust Trail Development Priorities for 2020.

Trail development along the Jones Valley Corridor closer to Bessemer (not shown in Figure 4) is not a priority for Freshwater Land Trust in the short-term. The City of Bessemer is currently focusing on connecting an existing trail, Bessemer Rail Trail, south of Valley Creek, to Bessemer Parks and Recreation facility (Freshwater Land Trust, 2020).

In-migration and growth across the south is occurring, including to Alabama; however, in the communities west and southwest of the City of Birmingham, population growth has been stagnant or declining. Amenities such as open spaces, recreational trails and parks, are important amenities for residents, neighborhoods, and businesses. As such, developing recreational facilities, parks, and amenities are a high priority for the County, and the cities of Birmingham, Bessemer and others (e.g., Red Rock Plan 2010; City of Birmingham Comprehensive Plan (Chapter 5) 2013).

4.0. FUTURE WITH PROJECT

The following sections the procedures used to evaluate recreation features as part of the selected alternative. Sections include recreation opportunities and measures, and the recreation evaluation.

4.1. Recreation Goals and Objectives

The goal for the Valley Creek project is to provide ancillary recreation benefits through recreational access to the detention areas in a manner that is consistent with the FRM project objectives. Related objectives include improving quality of life; providing aesthetically pleasing venue for physical exercise; educating visitors about the value and significance of the detention areas for FRM through interpretive signage; and other recreational amenities for residents of the west Birmingham neighborhoods. The detention basin trails would also expand upon the potential future opportunities associated with the Jones Valley Corridor trail development.

4.2. Recreation Opportunities and Measures

Providing recreational opportunities associated with the TSP would provide an opportunity for access to nature-based recreation for proximate communities. As part of the TSP, three detention areas are shown in the regional context in Figure 5, located along Valley Creek west of Birmingham and east of Midfield.

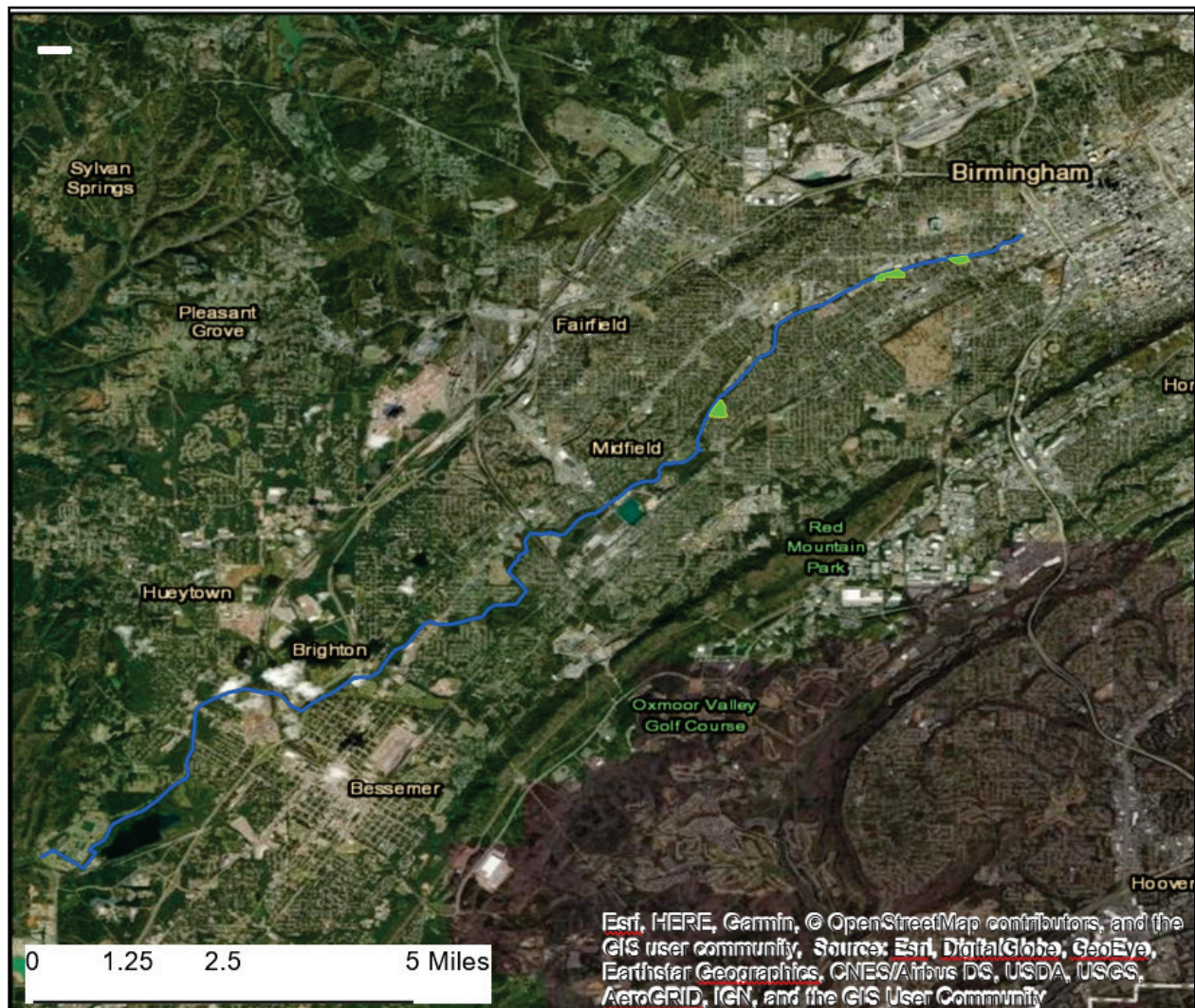


Figure 5. Location of Detention Areas Along Valley Creek.

Figure 6 shows the proposed trail locations within the three detention basins. The blue dotted line illustrates one of the the Red Rock priority trails (part of the Jones Valley Corridor) from the Birmingham CrossPlex to the Detention Basin 4, which would ultimately connect to the High Ore Trail to the southwest (and off the map). Construction of the detention areas would include a berm around their perimeter on which the trail would be developed. Trail development associated with the three detention areas (the TSP alternative) is consistent with the Red Rock Plan, adding additional recreational features associated with the Jones Valley Corridor trail (to be developed). The Corps would work closely with the project sponsors to identify specific alignment of the trails, and placement of the benches and signage. All placement and alignment would be compatible with project flood risk reduction project purposes.

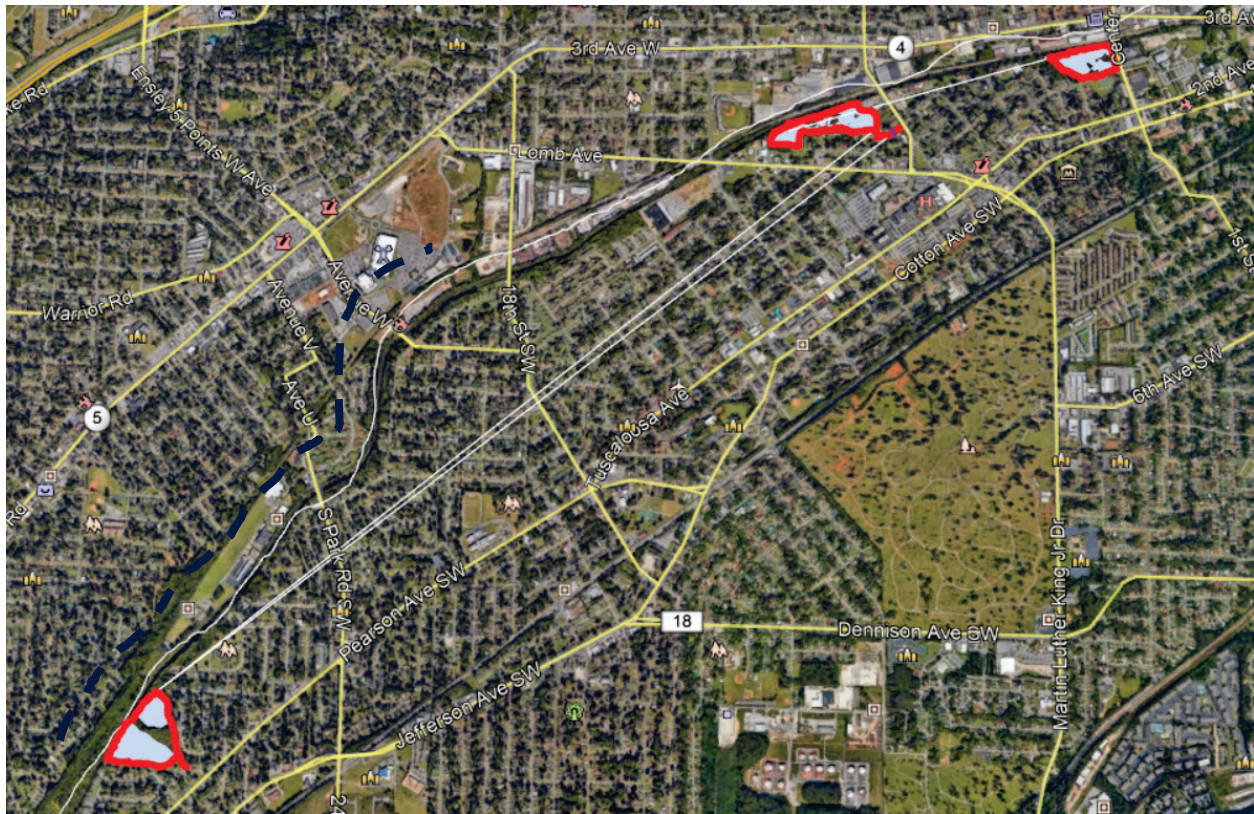


Figure 6. Conceptual Trail Alignment around the Perimeters of the Detention Basins.

Recreation amenities would also enhance the visitation experience by taking advantage of the natural values in proximity to the river corridor and watershed (EP 1165-2-1). Recreation measures are drawn from ER 1105-2-100, E-49, Ex. E-2, and include: gravel trails, signage, and benches. Recreation would be day use only and would add no costs for lands, easements, rights-of-way, relocations and disposal areas (LERRD). The estimated mileage of trails within each detention area is shown below.

- Detention Area 1 (eastern-most detention basin): 0.60 miles of AB3 gravel trail; 10 benches; and signage.
- Detention Area 2 (middle detention basin): 0.80 miles of AB3 gravel trail; 10 benches; and signage.
- Detention Area 1 (western-most detention basin): 0.70 miles of AB3 gravel trail; 10 benches; and signage.

Surface materials of the trails are proposed to be gravel, and the development will be appropriate for the type of trail uses anticipated (pedestrian, bicycle, multi-use). Any trailheads or parking lots would be developed on lands outside of the detention basins. Educational and interpretive signage regarding flood

risk, cultural and environmental resources would be installed along these trails as appropriate. Two interpretative signs are recommended for each detention basin, estimated by the length of the footpath. The information on this signage could enhance visitors' appreciation and enjoyment of the surrounding environment. Recreational access combined with interpretive educational signs is important in engaging the populace with the natural environment, providing an aesthetically pleasing recreational experience, with the potential to develop a desire for stewardship through direct experience, education, and sense of ownership.

The following section describes the evaluation completed for the recreation alternative plan.

4.3. Recreation Evaluation

The recreation evaluation involves an analysis of the National Economic Development (NED) benefits from recreation opportunities created from the proposed recreation facilities. Benefits are compared to costs to inform decision-makers on the feasibility of the recreation facilities.

4.3.1. Recreation Benefits

4.3.1.1. Overview of Unit Day Value Approach

As directed by the Planning Guidance Notebook (ER 1105-2-100), recreation benefits should be measured as the recreation users' 'willingness to pay' for the recreation opportunity. Since it is not possible to directly estimate demand for the proposed recreation facilities, nor are the proposed recreation facilities an integral part of project justification, the Unit Day Value (UDV) estimation technique is utilized for estimating recreation users' willingness to pay.

As the name implies, the UDV is an estimate of the monetary value placed on each day of recreational use. Recreational values are selected from a range of values provided based upon the type of recreation pursued. The UDV relies on informed opinion and judgment to estimate the average willingness to pay of recreation users. This method considers both the quality of recreation experience and the visitation rates, while utilizing an annually published 'unit day values for recreation' contained in Economic Guidance Memorandum 20-03. For the purposes of the proposed recreation facilities, the category of 'general recreation' is utilized because fishing, hunting, and other specialized recreational activities are not anticipated to occur; the guidelines for assigning points for general recreation as directed in EGM 20-03 were followed.

4.3.1.2. Estimating Recreational Use and Benefits (Short-Term)

In the short-term, the trails around the perimeters of the detention areas would primarily be used by neighborhood residents for walking and running, walking dogs, etc. There is currently not a corridor trail that connects the detention areas or along the Valley Creek drainage (Jones Valley Corridor). There are only a few neighborhood parks in this area so it is likely that these trails will induce new neighborhood use (Freshwater Land Trust 2020). Population located within a half mile of the three detention areas was estimated to be 6,400, based on US Census Blocks Groups from the American Community Survey (2017). Geographic constraints, such as Valley Creek and an abandoned rail line, would serve as deterrents for usage of the neighborhood trails and were taken into consideration in estimating the affected population.

The recreational use of the detention area trails was estimated based upon the Freshwater Land Trust Red Rock usership estimates (Freshwater Land Trust 2019), which were based on surveys (intercept and trail counter data) on five trail corridors in the Red Rock trail system in 2017. Based on discussions with the Red Rock Trail Director of the Freshwater Land Trust, it was determined that the range in usage associated with each of the detention areas would be consistent with usage associated with the High Ore Trail (located west of the detention basins) and the Vulcan Trail (located south of the detention basins) and that all of the use would be associated with new neighborhood use. These two trails represent low to moderate use estimates and are conservative figures (Freshwater Land Trust 2020). As a result,

recreational use was estimated to be from 13,100 to 48,000 users per year (per detention basin trail) (Freshwater Land Trust 2020). Recreational benefits are estimated to range from \$225,000 to \$819,000 per year (2020\$). Table 2 summarizes the economic benefits associated with the FRM TSP.

Table 2. Estimated Recreation Use and Economic Benefits on the Detention Basin Trails in the Short- and Mid-Term (2020\$)

Detention Basin	Unit Day Points	General \$/Day	Visitors	Average Annual Benefits
Detention Basin 1				
Benefits with Recreation Trails and Amenities (Low Estimate)	22	\$5.69	13,100	\$75,000
Benefits with Recreation Trails and Amenities (Moderate Estimate)	22	\$5.69	48,000	\$273,000
Detention Basin 2				
Benefits with Recreation Trails and Amenities (Low Estimate)	22	\$5.69	13,100	\$75,000
Benefits with Recreation Trails and Amenities (Moderate Estimate)	22	\$5.69	48,000	\$273,000
Detention Basin 4				
Benefits with Recreation Trails and Amenities (Low Estimate)	22	\$5.69	13,100	\$75,000
Benefits with Recreation Trails and Amenities (Moderate Estimate)	22	\$5.69	48,000	\$273,000
All Detention Basins				
Benefits with Recreation Trails and Amenities (Low Estimate)	22	\$5.69	39,300	\$225,000
Benefits with Recreation Trails and Amenities (Moderate Estimate)	22	\$5.69	144,000	\$819,000

4.3.1.3. Estimating Recreation Use and Benefits in the Longer-Term

In the longer-term, additional trail development along the Jones Valley Corridor would occur, with the goal to connect trails to promote a regional trail system. As noted previously, The Freshwater Land Trust has identified a portion of the Jones Valley Corridor as a priority trail for development from the High Ore Trail to the Birmingham CrossPlex. The western-most detention basin (VD4) falls within this priority trail segment. This segment would connect trails, such that users could connect to the High Ore Trail and Red Mountain Park, for example from the CrossPlex, which would facilitate longer walks, runs, and bike riding. In addition, families that come to the CrossPlex for all day or all weekend sports events could take advantage of the trail system to get some exercise. The CrossPlex is likely to bring visitors in from outside of the local area, who could take advantage of the recreational amenities. When the detention basin (VD4) trail connects to this priority Jones Valley Corridor trail, recreation usage is likely to increase.

The Jones Valley Corridor trail from the Birmingham CrossPlex to downtown Birmingham (called the Valley Creek Rail Greenway trail) can be completed after active rail use has ceased; however, the timing of this development is uncertain. This portion of the trail would connect the two eastern-most detention basins to the Jones Valley Corridor. This trail would facilitate walking and biking commuting from West Birmingham to work in downtown Birmingham. It will also allow the connection of downtown Birmingham to the High Ore Trail and Red Mountain Park, along the portion on the Jones Valley Corridor just west of Birmingham.

In addition, the development of the Jones Valley Corridor trail along Valley Creek to the west of the High Ore Line is also in the Red Rock Plan, but its development is anticipated to be further into the future and

the timing of its development is uncertain. This trail would connect the communities of Bessemer, Brighton and Lipscomb to recreational use in the High Ore Trail and Red Mountain Park, with the potential for commuting benefits from these western communities to downtown Birmingham. As the detention basins are connected via a corridor trail and as the regional trail is developed along the Jones Valley Corridor connecting Bessemer with downtown Birmingham, recreation use of the detention basin trails is likely to further increase.

The future recreational use of the detention basin trails is uncertain and would be dependent on the timing of the trail development within the Jones Valley Corridor, and its connection with the detention basin trails. However, it is likely to increase in the future with additional trail connectivity. The highest level of use that was surveyed in 2017 by Freshwater Land Trust occurred at the Lakeshore Trail, south of Birmingham between the communities of Homewood and Vestavia Hills, with approximately 145,600 users per year (Freshwater Land Trust 2019). With an assumption of this level of trail use at each of the detention basin trails, the economic benefits are estimated to be \$828,000 on each trail and \$2.5 million for all three detention basins. However, because this future use and timing is uncertain, this estimate is meant for consideration and should not be incorporated into the recreation cost benefit analysis or the NED benefits.

4.3.2. Recreation Costs

Recreation costs were estimated based upon the scope and scale of the recommended recreation trails and amenities. For example, footpath cost estimates are based upon a per linear foot cost estimate and the estimated length of trail proposed for each detention basin, while signage is estimated based upon the number and size of signage proposed (USACE Cost Engineers 2020). Table 3 provides an overview of recreation trail and feature costs by detention basin including the construction costs (including signage and benches), interest during construction, and the total annual cost. Total project first costs are estimated to be \$224,000, including contingency, construction management, planning, engineering, and design. The fully funded construction cost for recreational features is \$248,000 (total project first cost escalated to FY2023).

The federal share of the recreation cost is estimated to be 50% of \$248,000 or \$124,000. The total construction cost of the TSP is estimated to be \$49.9 million, of which 65 percent or \$32.4 million is estimated to be the federal portion of the costs. The Federal cost share of \$124,000 for the recreation facilities would account for less than 0.4 percent of the Federal cost share of the fully funded cost.

Table 2. Recreation Facilities Cost Estimate by Area.

Costs	Detention Basin 1	Detention Basin 2	Detention Basin 4	Total
Construction, Signage, Benches Cost*	\$65,000	\$84,000	\$75,000	\$224,000
IDC (1 yr, 2.75%)	\$1,800	\$2,300	\$2,100	\$6,200
Investment Cost	\$66,800	\$86,300	\$77,100	\$230,200
Annualized Investment Cost (50 years, 2.75%)	\$2,500	\$3,200	\$2,900	\$8,500
Annual OMRR&R**	\$1,000	\$1,000	\$1,000	\$3,000
Total Annual Cost	\$3,500	\$4,200	\$3,900	\$11,500

Sources: *The construction costs include construction management, planning, engineering and design, and contingency (30%).

**Includes annual maintenance costs for mowing, clean-up, sign replacement, and re-grading, as needed.

4.4. Recreation Benefit Cost Analysis and Recommendation

Table 4 provides an overview of the benefit cost ratio by detention basin and in total across all three detention areas. All of the benefit-cost ratios are well over 1, with the lower benefit estimates showing a

benefit-cost estimate between 18 and 21, and the higher benefit estimates showing a benefit-cost ratio between 65 and 78.

Table 3. Benefit-Cost Comparison.

Benefit/Cost	Detention Basin 1	Detention Basin 2	Detention Basin 4	Total
Total Annual Recreation Cost	\$3,500	\$4,200	\$3,900	\$11,500
Annual Recreation Benefits (Low)	\$75,000	\$75,000	\$75,000	\$225,000
Annual Recreation Benefits (High)	\$273,000	\$273,000	\$273,000	\$819,000
Benefit-Cost Ratio (Low)	21	18	19	20
Benefit-Cost Ratio (High)	78	65	70	71

4.5. Other Recreational Benefits

Trails provide low or no-cost recreational opportunities and the potential for transportation options to the public, while improving quality of life for residents. Trails can also stimulate business creation, influence corporate location decisions, boost spending at local businesses, increase property values, reduce medical costs by encouraging exercise, and generate tax dollars. These benefits have been documented in an array of economic studies conducted across the United States (Conservation Tools and Pennsylvania Land Trust Association 2011). Trails provide a number of benefits, including the following.

- Trails can increase the value of nearby properties.
- Trails can make communities more attractive places to live. When considering where to move, homebuyers rank walking and biking paths as one of the most important features of a new community.
- Trails can influence business location and relocation decisions. Trails can make communities attractive to businesses looking to expand or relocate because of the amenities they offer to employees.
- Trails can reduce medical costs by encouraging exercise and other healthy outdoor activities. According to a survey conducted by the University of Alabama School of Public Health, 89 percent of all survey respondents in Jefferson County, Alabama (from a representative sample) indicated they would partake in walking or biking if they have access to a nice, safe place). Seventy-seven percent of the group that indicated they currently have not been physically active in last month said they would use it, and 19 percent said they would use it more than 4 times a week (UAB 2010).
- Trails can revitalize depressed areas, creating a demand for space in what were once vacant buildings.
- Trails can provide transportation options and cut fuel expenses, offering reliable means of transportation for short distance trips.
- Trails can provide low or no-cost recreation to families relative to other recreational services that could be provided by government.
- Trails can boost spending at local businesses, depending on their location. Communities along trails, often called trail towns, can benefit from the influx of visitors going to restaurants, snack shops and other retail establishments.
- Trails can increase tax revenues in the communities in which they are located.

4.5.1. Regional Economic Development

The project recreational features and amenities could provide regional economic development (RED) benefits to the communities in which they are located, especially if the detention area trails support

visitation from outside of the local area. Recreational use by people outside the local areas can inject visitor spending into local businesses, and even encourage business development, such as businesses within or in proximity to the Birmingham CrossPlex, which would support jobs and income and tax revenues in the region. As the Jones Valley Corridor trails are developed in the future, more connectivity of the trails would lead to higher levels of visitation and increases in the regional economic benefits over time.

4.5.2. Other Social Effects

The project recreational features and amenities provide other social effects (OSE) for neighborhoods and residents, providing low or no-cost recreational opportunities to residents, while making communities more attractive places to live. Recreational trail and amenities built within the three detention areas can revitalize depressed areas, creating a demand for space in what were once vacant lots or industrial or residential buildings. Recreational trails associated with the project encourage exercise and other healthy outdoor activities, increasing the health and wellbeing of residents and trail users. According to a survey conducted by the University of Alabama School of Public Health, 89 percent of all survey respondents in Jefferson County, Alabama (from a representative sample) indicated they would partake in walking or biking if they have access to a nice, safe place (UAB 2010).

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