

# **Final Report**

## **Floyds Fork Comprehensive Watershed Based Plan**

Grant # C9994861-03

Application for Floyds Fork Comprehensive Watershed-Based Plan

Application #17

Memorandum of Agreement #M-06134698

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Louisville Metro Parks: Mike Heitz and Lisa Hite

Tucker Station Neighborhood Association: Steve Porter

Bullitt County: Evelyn Fackler

Bullitt County Sewer District: Jerry Kennedy

Bullitt County Health Department: Mary Ann Blanton

City of Hillview: Jim Harned (HSE Engineers)

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<sup>1</sup> There was no QAPP, because project monitoring was postponed pending the results of other monitoring occurring during the project.

## **1.0 Executive Summary**

The purpose of this project was to create a watershed-based plan for Floyds Fork watershed which, if fully implemented, would restore and protect designated uses in the watershed. This watershed, nested in the Salt and subsequently the Ohio River watersheds, covers 284 square miles. Floyds Fork is a priority watershed for the Kentucky Division of Water and for the Salt River Basin Team.

Floyds Fork boasts a long history of stream protection activity, and there was widespread engagement in the project. About 50 people were solidly engaged, and hundreds were supportive and assisted in small ways.

While the project was operational, the Steering Committee and project partners assembled an extensive library of materials and conducted a very successful Roundtable. A Technical Advisory Committee analyzed existing watershed data and conducted watershed assessments. A Land Use Committee analyzed local land use and land use policies and practices.

The Floyds Fork Watershed Based Plan (WBP) provides a comprehensive report of the project's functions and of watershed characterization and analysis. The project's sudden demise, caused by the filing of a lawsuit, left the WBP incomplete yet full of extensive information, analyses, recommendations, and preliminary recommendations.

Because the WBP documents the project's progress and accomplishments, this Final Report focuses more on the process and lessons learned. The primary lesson is that the Steering Committee should have more formally established its operating procedures and would have benefited from a facilitator.

## **2.0 Introduction & Background**

### **2.1 Purpose**

The overall purpose of this project was to develop a Watershed Based Plan (WBP) for Floyds Fork that, if fully implemented, would restore and protect designated uses in the watershed. Achieving this purpose would contribute to the implementation of Kentucky's Nonpoint Source Management Program. Successful achievement of this purpose was expected to produce a point and nonpoint source (NPS) reduction roadmap for parts of 6 counties, ensure continued support from political entities, government agencies, and grassroots groups, and provide a mechanism to leverage funding for NPS reduction projects that are identified in the WBP, but are not funded in this proposal.

## **2.2 Reasons for Choosing This Project**

This project was chosen because Floyds Fork is a priority watershed for the Kentucky Division of Water (KDOW) Salt River Basin Team. The 2004 303(d) List included 93.2 miles of first priority streams in the Floyds Fork watershed that do not support aquatic life and/or swimming uses (KDOW, 2004). In addition, there was significant interest and cooperation pledged to develop the WBP. There is a very active and local group of citizens, the Floyds Fork Environmental Association (FFEA). Stantec Engineering Consulting (formerly Fuller, Mossbarger, Scott and May Engineers) was interested in the technical elements of the WBP. KWA had long standing, good working relationships with both FFEA and Stantec. Finally, FFEA Co-Chair Teena Halbig pledged to help secure the cooperation and participation of the 6 counties in the Floyds Fork watershed.

Water quality and related issues in this watershed have received much local, regional and state-level attention for decades – as evidenced by the 1981 Watershed Study listed in Section 2.4, below. Despite the challenges associated with multiple jurisdictions and past controversies, the timing seemed right to draft a joint roadmap for watershed protection.

## **2.3 Goals and Objectives**

The **Objectives** of this project included compiling and assessing relevant information using readily available tools; establishing a Watershed Steering Committee, a Land Use Committee and a Technical Advisory Committee to develop components of the WBP; to raise public awareness through roundtables, booths and other forums; to evaluate, recommend and implement BMPs through improvements to the local regulatory framework of comprehensive plans, codes and ordinances; to estimate load reductions, and to leverage this WBP to secure additional funding to continue local implementation after this project is completed.

### Goals

Goal 1: To gather all relevant documents, studies, permits, land-use ordinances, regulations, BMP measures and data on the watershed.

Goal 2: To raise public awareness of watershed issues and the need for local support to mitigate NPS problems, and the availability of grant funds to develop WBPs to further define and identify sources of and solutions to water quality problems in local communities.

Goal 3: Develop monitoring plan and select monitoring locations.

Goal 4: Develop Watershed-Based Plan for Floyds Fork.

Goal 5: Work with each municipality and community in the watershed to begin BMP implementation that is consistent with the WBP.

Goal 6: Meet reporting requirements for the 319(h) Grant, including the Annual Report requirements.

## **2.4 Other relevant work**

1. Approved TMDL for Floyds Fork (USEPA, 1997)
2. Approved TMDL for Chenoweth Run (USEPA, 1997)
3. Floyds Fork Watershed Study/Plan (Jefferson County, 1981)
4. FFY2003 319(h) grant, Bullitt County Stormwater
5. FFY2006 319(h) grant WBP, Curry's Fork
6. KDOW, Brooks Run TMDL currently under development

## **3.0 Materials & Methods**

### **3.1 Project Area Description**

Floyds Fork watershed covers 284 square miles and includes 104 miles of stream, in an area south of the Ohio River and east of the urban area of Louisville, Kentucky. Floyds Fork is a tributary to the Salt River, which enters the Ohio River south of the Louisville-Jefferson County area. A complete description of the project area is included in the Floyds Fork Watershed Based plan, summarized in the Executive Summary and in full detail in Sections 1.2 and 1.3 of the Plan.

### **3.2 Methods**

3.2.1 Compiled a Floyds Fork Library. The Project Partners compiled relevant documents, studies, permits, land-use ordinances, regulations and data on the watershed. Most of the more important information is on the web site at <http://www.kwalliance.org/WatershedGroupResources/WatershedbasedPlanningProjects/FloydsForkWatershed/FloydsForkDocumentLibrary/tabid/251/Default.aspx>. The library is easily accessed and very visible with a graphic on every page of KWA's web site.

Over 380 water quality-related documents, including publications by federal, state and local agencies, such as the United States Geological Survey (USGS), Kentucky Geological Survey (KGS), Kentucky Division of Water (KDOW), and U.S. Army Corps of Engineers (USACE), as well as newspaper articles and other documentation have been compiled. Some of these are included in Appendices to the Watershed Based Plan; others are included in Appendices D and E of this report.

Documents describing models which have been developed for the watershed, presentations relevant to watershed planning, and numerous photographs of the watershed are also included in Library Documents, Volumes I and II, in Appendices D and E. These Libraries also include publicly available data regarding surface water, groundwater, wastewater, soils, land use and water use.



3.2.2 Conducted Education and Outreach. Electronically-available documents were posted to a Floyds Fork website hosted by KWA (see information above). A password protected page was also developed for use in the project; however, the page was not available until early 2008, when the project stopped, so that function was never used.

A feature article about the project was published in the statewide environmental publication Land, Air and Water. An educational brochure about the watershed and the Watershed Planning process was published and has been widely distributed. This brochure was developed and initially included in the 150+ registration packets for the first Floyds Fork Watershed Roundtable. Copies were included in the notebooks for each of the Steering Committee members and additional copies were available upon request. The brochure was also available at the 2007 Floyds Fork Environmental Association booth at the Middletown and Gaslight festivals and the 2007 Floyds Fork Canoe Clean-Up. Approximately 1,000 copies of the brochure were distributed at these events in the watershed.

Furthermore, Stantec gave an educational presentation at the American Water Works Association Water Professionals Conference, held in Louisville Kentucky in July of 2007. KWA gave a presentation about the project at the Kentucky Chapter of the American Planning Association's 2007 Fall Conference.

Stantec prepared and provided a three-hour training session to the Land Use Committee and others on the Spreadsheet Tool for Estimating Pollutant Load (STEPL) model developed for the watershed. The training included development of a STEPL model, methods for including Best Management Practices in the model for generating load reduction estimates, and an overview of common BMPs that reduce nonpoint source pollution.

3.2.3 Planned and Hosted the 1<sup>st</sup> Floyds Fork Watershed Roundtable. The KWA, with assistance from the Project Partners, planned, advertised and hosted the Roundtable in February 2007 at the University of Louisville's Shelby Campus. Approximately 155 people attended the day-long event. The Roundtable received good advance publicity and was taped and aired on Louisville Metro TV. A DVD from the Roundtable is included along with this final report. Several new items were added to the WBP based on the results and feedback from Roundtable participants. Finally, several additional citizens asked to be included in notices about future Committee meetings.

3.2.4 Established Floyds Fork Watershed Committees. A Steering Committee was formed to provide overall direction, identify funding opportunities and produce the WBP document. The Floyds Fork Environmental Association (FFEA) and KWA co-chaired the Steering Committee. Members included key policy-makers from each county and the co-chair of the Technical Advisory Committee (TAC) and the Land Use Committee (LUC).

The Steering Committee met on a regular basis from the fall of 2005 until March 2008. At the time the project stopped, the Steering Committee had reviewed many sections of the

Watershed Plan drafted for their review by both the TAC and the LUC. At the November 2007 the Steering Committee first began to consider goals and monitoring functions. Records of the Steering Committee's work and workplan are included in Appendix 1.12 of the Floyds Fork Watershed Based Plan.

The Technical Advisory Committee (TAC) guided data review and watershed assessment. Stantec (FMSM) Engineers co-chaired this committee, with the Director of the Oldham County Sewer District. The TAC met regularly from January 2006 through March 2008. The TAC completed their scope of work, with the exception of additional monitoring in the watershed, and drafted significant portions of Chapters 1 and 2 of the Watershed Based Plan. For more information on the TAC see Appendix 1.10 of the Floyds Fork Watershed Based Plan.

The Land Use Committee (LUC) met regularly from July 2006 until May 2008. The LUC was co-chaired by a KWA staff member and the Director of Planning and Design Services for the Louisville Metro government. The goal of the Land Use committee was to generate the political will to facilitate improvements to local land use decisions. The first steps in this process were to examine land use and planning policies and practices throughout the watershed, including an analysis based on a Codes and Ordinances analysis developed by the Center for Watershed Protection. The LUC was the largest committee and included widespread participation from a diverse group, including planners, health departments, local citizens, developers, and others. The LUC completed about eighty percent (85%) of its work before the project stopped. For more information on the LUC see Appendix 1.11 of the Floyds Fork Watershed Based Plan.

3.2.5 Monitored and Assessed Watershed Conditions. The Technical Advisory Committee (TAC) guided the watershed characterization and assessment. The watershed assessment utilized Spreadsheet Tool for Estimating Pollutant Load (STEPL) to estimate nonpoint source loads of total phosphorus, total nitrogen, and biological oxygen demand. STEPL is a spreadsheet-based version of the Generalized Watershed Loading Function (GWLF) model. Additional information regarding the STEPL model is provided in Appendix 2.11 of the Floyds Fork Watershed Based Plan.

A modified version of the Watershed Assessment for River Stability and Sediment Supply (WARSSS), Phase I, was piloted in three subwatersheds. WARSSS, developed by Dave Rosgen for USEPA, can be used to identify priority locations for stream restoration. This phased approach includes a Reconnaissance Level Assessment based on an analysis of extant data to improve understanding of sources and key processes. The Rapid Resource Inventory phase uses the results of Phase I and additional assessment to categorize subwatersheds into high/medium and low risk categories. This project applied Phase I to three subwatersheds to identify over 100 sites where erosion and sedimentation were indicated to be occurring. Ten

(10) sites were evaluated by a stream restoration professional to determine their suitability for restoration projects. Three potential project sites were identified.

An improved understanding of the karst influences on water quality and hydrology was gained by working closely with USGS, KGS, KDOW's Groundwater Branch and other karst experts, integrating their data and seeking funding to further their karst studies.

New monitoring was a small component of the overall project and soon after the grant had been awarded, partners learned that a large new United States Geological Survey (USGS) monitoring effort was about to begin. KDOW and USEPA intended to use the results of this monitoring to develop / update wasteload allocations and potentially to develop / update TMDLs for the watershed. Therefore, a decision was made to postpone the monitoring funded in this project until the results of the USGS study were analyzed and project funding could be better used to fill any remaining data gaps. The project ended before planned project monitoring took place.

3.2.6 Reviewed Land Use and Land Use Policies and Practices. The LUC reviewed Comprehensive Plans, zoning, development codes and ordinances, special overlay districts, onsite wastewater, wastewater collection systems, and floodplain ordinances for each of the watershed's counties and local governments. The LUC used the Center for Watershed Protection's Codes and Ordinances Worksheet and other tools to analyze policies and practices. The LUC examined current land use, expected land use changes, and population and development projections. The LUC did not finish work before the project stopped. See Section 1.8 of the Floyds Fork Watershed Based Plan for unfinished LUC work and additional recommendations for future planning.

The LUC used the Long Term Hydrologic Impact Analysis (LTHIA). However, the committee found the LTHIA model to be insufficient for the analysis members thought necessary to fully analyze options. Stantec (FMSM) provided training for the LUC for LTHIA use and also for the more sophisticated Spreadsheet Tool for Estimating Pollutant Load (STEPL) model. Unfortunately, LUC members ceased meeting soon after the STEPL training session, so no further analysis took place.

3.2.7 Drafted WBP. The Project Partners, with assistance from the Steering Committee, used the results of the TAC and LUC to draft the WBP. The WBP would have addressed the 9 USEPA components for a WBP, including a Watershed Action Plan to identify recommended strategies, NPS management strategies, commitments, known and potential funding sources and an implementation schedule. However, the project was stopped before completion.

## 4.0 Results & Discussion

Results and findings have been fully documented in the Floyds Fork Watershed Based Plan.

## 5.0 Conclusions

**5.1 Measures of Success.** The measures of success for this project were established with KDOW as milestones, based firmly on the original 319(h) application. These are listed below.

Measures numbered one (1) through sixteen (16), which cover project initiation, coordination with KDOW, the first Roundtable, and committee operations, were completed, with the following alterations:

- Steering Committee meetings (item 8) were held quarterly, rather than bi-monthly. This alteration was made to accommodate a smaller budget than originally anticipated.
- Technical Advisory Committee (item 14) completed its work in six meetings (rather than 16).
- Land Use Committee (item 15) held eleven meetings; sixteen may have been sufficient.

The Steering Committee had not yet begun holding regular public meetings [item seventeen (17)]. However, public awareness and participation in the project was facilitated through the Roundtable and a few formal and informal presentations about the project. See also section 1.5 of the Floyds Fork Watershed Based Plan.

Because monitoring was delayed pending results of existing monitoring programs, there was no QAPP or monitoring conducted. See section 3.2.5, above (last paragraph). Therefore, items eighteen (18), nineteen (19), and twenty three (23) are not applicable.

Drafts and revisions for chapter one (1) through five (5), as described in items twenty (20), twenty four through twenty six (24-26), and thirty one through thirty three (31-33), were partially completed: all were drafted and revised, but chapters four (4) and five (5) were not completed or finalized.

Review of alignment of land use, stormwater and sediment control ordinances (items 21 and 22) was conducted to the extent possible. At least one county's ordinances were in flux during this project. Working with communities to revise or improve these ordinances (items 36 and 37) had begun to the extent that the Land Use Committee engaged local government planners; the project may have impacted ordinance development taking place at that time, but partners have no knowledge of evidence of tangible progress was made.

The project was stopped prior to production of a BMP plan; therefore items twenty seven (27) and twenty eight (28) were not completed.

No annual report (item 29) was requested. Because implementation planning did not take place, implementation funds (item 30) were not identified or sought.

The Land Use Committee received training about LTHIA (item 31), and was given a training session in STEPL, instead. (STEPL is a more advanced program.)

## KWA's Milestones

Milestone	Final Status
1. Submit all draft materials to the Cabinet for review and approval.	Complied
2. Submit advanced written notice on all workshops, demonstrations, and/or field days to the Cabinet.	Complied
3. Compile Floyds Fork Library	
4. Notify partners and schedule initial planning meetings.	Complied
5. Set up Floyds Fork pages on KWA web site.	Completed
6. Submit advanced written notice to NPS Program staff of all public Meetings.	Complied
7. Establish Floyds Fork Steering Committee.	Completed
8. Hold bi-monthly Steering Committee meetings.	Yes-Quarterly
9. Plan and host 1st Floyds Fork Watershed Roundtable.	Completed
10. Submit advanced written notice to NPS staff for Roundtable.	Complied
11. Submit drafts of all materials, Roundtable agenda, publicity material, newsletter or news articles to NPS Program staff approval.	Complied
12. Establish Land Use Committee.	Completed
13. Establish Technical Advisory Committee.	Completed
14. Hold 16 quarterly TAC meetings.	Completed (6)
15. Hold 16 quarterly LUC meetings.	Held 11 of 16
16. Draft Watershed Based Plan Outline	Completed
17. Hold regular public meetings throughout watershed at times/places determined by the Steering Committee.	Incomplete
18. Submit draft QAPP to KDOW.	NA
19. KDOW reviews and approves QAPP.	NA
20. Watershed Based Plan draft Chapters 1-2.	Completed
21. Review alignment of land-use and sediment control ordinances throughout the watershed (1 county every quarter).	Partial
22. Review alignment of stormwater programs and activities throughout the watershed (1 county every quarter).	Partial
23. Conduct Water Quality Monitoring.	NA
24. Watershed Based Plan - Revise Chapters 1-2.	Completed
25. Watershed Based Plan - Draft Chapters 3-4.	Completed
26. Watershed Based Plan - Revise Chapters 3-4.	3 90%; 4 75%
27. Submit Draft BMP Implementation Plan (BMP IP) to KDOW.	Incomplete
28. KDOW reviews and approves BMP IP.	NA
29. Upon request, submit Annual Report that meets KDOW requirements.	Not requested
30. Work with interested stakeholders to identify and apply for funding to	

meet objectives in the Plan.	Incomplete
31. Watershed Based Plan - Draft Chapters 5-6.	5 Partial; 6 NA
32. Plan and host 2 LTHIA training sessions.	1 LTHIA, 1 STEPL
33. Watershed Based Plan - Revise Chapters 5-6.	5 Partial; 6 NA
34. Watershed Based Plan - Draft Chapters 7-8.	NA
35. Watershed Based Plan - Revise Chapters 7-8.	NA
36. Work with communities to revise and improve land-use and sediment control ordinances throughout the watershed.	Partial
37. Work with communities to revise and improve of stormwater programs and activities throughout the watershed.	Partial
38. Watershed Based Plan - Draft Chapters 9-10.	NA
39. Watershed Based Plan - Revise Chapters 9-10.	NA
40. Watershed Based Plan - Draft Chapters 11-12.	NA
41. Watershed Based Plan - Revise Chapters 11-12.	NA
42. Watershed Based Plan - Review, Edit, Compile Appendices.	Completed (partial)
43. Complete Draft Watershed Based Plan.	Ch 1-3 & partial 4,5
44. Plan and host 2nd Watershed Roundtable.	Incomplete
45. Revise Plan to reflect input from Roundtable.	NA
46. Submit Watershed Based Plan to NPS Program staff for approval.	Underway (partial)
47. KDOW reviews and approves Watershed Plan.	TBD
48. Finalize and publish Watershed Based Plan.	TBD
49. Prepare and submit three hard copies and one electronic copy of the Final Report and submit three hard copies and one electronic copy of all products produced.	Herewith (1 CD)
50. Closeout Project.	Pending

## 5.2 Conclusions, Recommendations and Lessons Learned

This project is an example of what can go very well and terribly wrong in watershed based planning. Despite its sudden demise, it is an example of significant progress and broad engagement.

The Floyds Fork Watershed Based Plan, albeit partial, includes technically-based recommendations for further action in the watershed. Some of these suggested a change in approach (e.g., continually evaluating land use per subwatershed), and some suggest how to build on the foundational work that was achieved during the life of the project. This section, then, focuses on lessons learned about project management.

More than 50 people were solidly engaged with this project, and hundreds kept informed and helped in small ways. Many of these people were dismayed and confounded when a few members of one organization stopped everything cold.

The foundational work was solid and most participants were poised to step into the difficult decision making stage of watershed improvement recommendations. The Technical Advisory Committee had completed analysis of existing watershed data and had conducted watershed assessments; the Land Use Committee was gearing up to tackle recommendations for Low Impact Development and retrofitting.

The Steering Committee (SC), where the proverbial buck would have stopped, posed a necessarily different situation. Generally speaking, the group first focused on the Roundtable. It then spent some time clarifying roles and quickly moved to reviewing chapters submitted by the two subcommittees. There was not enough attention on the SC structure and process, so that the SC lacked operational coherency. Some of the responsibility for this deficiency lies with amendments in the project budget, which trimmed the SC resources, limiting the number of meetings. Some of it stems from the size and complexities of the watershed. Some of the deficiencies lie in the difficulty of balancing the need for an informal, non-aggressive atmosphere required for discussion and learning with the need for making clear decisions to which a group feels accountable. Project management, in this case, neglected too many formalities.

Specifically, one problem was the failure to formally define SC membership. Seven months into the project, the lead partners spent several long conference calls deliberating formal membership. In retrospect, it seems obvious that this should have occurred in conjunction with the first few SC meetings. However, for a project with such a significant level of local involvement and a project in a watershed of this size and complexity, it was difficult to determine who should be invited to have a seat on the SC – while maintaining a manageable number of members. In this situation, especially, more effective local leadership would have been helpful in clarifying the complex political landscape.

Another problem was uneven co-chairmanship. SC leadership was theoretically split between two individuals, but one was paid and one was a local volunteer. Although both are very familiar with facilitated processes, neither were professional facilitators. Furthermore, one carried more of the operational load. Efforts to find a more effective local Chair from within the SC had not come to fruition by the time the project stopped.

The largest problem, however, was that the SC began substantive work prior to making decisions about procedures. There was no decision about quorum and no agreement as to voting process, privileges or the size of voting majority required for decisions. Thus, the group was unprepared to make difficult decisions. An approved, written decision-making structure and process would have been a valuable tool.

About one year into the project, the need for more active, neutral facilitation was clear to many. Unfortunately, a small minority of SC members were mistrustful of the idea and the chances of finding a neutral party. The mistrust was compounded by the concurrent announcement, on the part of the Division of Water, that the watershed plan should be expanded, with additional funding, to address the interplay of wastewater and nonpoint source management measures within this watershed, rather than to characterize wastewater issues as per the original scope. While many SC members welcomed this opportunity, others reacted from a deep well of mistrust, based on fears of “water quality trading” and a history

of controversial actions in wastewater planning and operations and the influence of development interests in the area.

In conclusion and summary, project managers recommend, first and foremost, attention to the formal questions of membership and decision making processes for oversight committees such as this SC. While there must be a balance between informal and formal arrangements, these specific items cannot be neglected.

Second, managers stress the importance of finding and nurturing local leadership that is willing to be accountable to the procedures established by the oversight committee.

Finally, the strong foundation documented in the Floyds Fork Watershed Based Plan would provide a solid base should anyone in the region choose to pursue further watershed-based planning.