

# **James River Watershed Watershed Restoration Action Strategy**

## **Introduction**

A major portion of the James River watershed (11010002) is currently on the 303d list with 58.5 miles of the river shown as being impacted by both urban point and nonpoint source pollution. The James River watershed is a high priority according to the Unified Watershed Assessment (UWA) where it ranks 5th out of 66 watersheds in Missouri. High potential for groundwater pollution, urban non-point sources, high animal unit density, and moderate biological density are factors which contribute to the high ranking. According to the UWA, the James River is scheduled for restoration activities in FY99.

Because of the size of the James River watershed, a restoration project on the entire area would be impractical for one individual project. Although project activities will occur throughout the entire watershed, this project will focus most of the restoration efforts in three subwatersheds in the basin. The primary objective is to aid restoration in three prioritized 14-digit HUC watersheds through the implementation of Best Management Practices. The secondary objective is to provide an effective information/education campaign to benefit the entire basin. This project will also continue the efforts to complete a watershed assessment based on scientific data.

Because of the enormity of the James River Watershed, three 14 digit sub-watersheds - assessed to be priorities for restoration - have been targeted for specific restoration activities. "Upper Flat Creek", one of the three initial sub-watersheds selected, is primarily agricultural. Upper Flat Creek was selected because of its high concentration of poultry operations and poor riparian corridor condition. The second watershed is located south of Springfield, MO and is an urban watershed (known as "Urban Target" in this project). This watershed was selected because it is the fastest growing (population and number of businesses) 14 digit hydrologic unit in the entire 930,000 acre James River watershed, and is in need of urban soil testing, septic tank management, and a strong information/education campaign. The third watershed, referred to as "Lower Finley/Elk Valley", will replace the Upper Crane Creek watershed. This decision was based on a year long non-point source phosphorus assessment of the James River Watershed by the Missouri USDA-NRCS.

This Watershed Restoration Action Strategy (WRAS) is being developed based on the best and most current data available. This WRAS is a document considered to be dynamic and will be revised as needed when new information is obtained. Revision of goals and objectives may be necessary as the watershed assessment is developed and concluded.

## **History of JRBP**

The James River Basin Partnership (JRBP) is a grassroots, not-for-profit 501 (c) (3) organization working to improve and protect the water quality of the streams, rivers and lakes in the James River Watershed. The JRBP is sponsor of the James River 319 project.

The JRBP was formed in 1997, as a project of Southwest Missouri Resource Conservation and Development. Initially, the JRBP was funded through a 319 grant from the Missouri Department of Natural Resources. In August of 1999, the James River Basin Partnership became an autonomous organization, relying on other grant funding and donations from individuals, businesses and governments across the watershed.

The strength of the Partnership can be substantiated by the number of committed, local citizens involved in JRBP projects, and by the numerous, successful, collaborative projects with other organizations that are also working for better water quality. For example: The Partnership is growing - in January of 1998 the JRBP had approximately 40 members. Today, more than 575 members support

the JRBP through volunteer time, financial contributions or in-kind donations

Leading the organization is a core group comprised of the Chair, Vice Chair, Board of Directors, Technical Advisory Team, and the Executive Director. The JRBP Board is comprised of dedicated volunteer members from across the watershed that represent the diversity of the James River Watershed - county governments, city governments, the James River, businesses, agriculture (dairy, beef and poultry) and members-at-large. The JRBP Board is a working board, and each board member serves on one of six JRBP Committees - Education, Marketing, Resource Development, Science, Land Stewardship and Special Events.

## **Public Outreach**

Water quality in the James River has been an important issue to southwest Missouri for several years. Over the past few years, many articles have been published and much airtime has been devoted to the water quality issues in the James River, as well as Table Rock Lake.

In recent years, several events have been organized by JRBP and others to help educate the public on the issues. Below are a few of the past outreach efforts that have been performed in the watershed by the JRBP and other organizations.

\* Monthly public meetings held by JRBP help inform the public of what is taking place in their watershed. Attendance at monthly meetings has increased - up from an average of 20 people per meeting in January of 1998 - to an average of 50 per meeting today.

\* A phone survey of 638 residents of the James River watershed was completed in 1997 by JRBP. In this survey, over 70% of the respondents said pollution in the James River was a major concern to them. A little over 80% thought the James River was more polluted today than ten years ago.

\* JRBP was involved in community events to spread their message and purpose such as: Bass Pro Shops Conservation Weekend, James River Days, Earthfest, Artsfest, Ozark Empire Fair, Watershed Extravaganza, Farmfest, Ozark Nature Trail, Clean Water Cruise, Chili Cook-Off, Make a Difference Day and Earthday Cleanups.

\* Various personal contacts with local, state, and federal legislators to keep them informed of the events and concerns in the watershed.

\* Various PSAs, brochures, newsletters and articles published to increase awareness of water quality issues. These include: James River Rescue radio and television promos, television news coverage of water quality events, JRBP brochure, quarterly *Current* newsletters, letters to the Editor of local newspapers, *Ozarks Farm and Neighbor* articles, *Today's Woman Journal* articles, *Watershed Committee of the Ozarks Newsletter* article, hundreds of letters and mailings to members and friends, beginning design of JRBP website, design of clean water billboards with Missouri Neon.

\* Promotion of EQIP (Environmental Quality Incentive Program) as a program to implement conservation practices in the James River watershed.

\* Streamside Landowners mailings and workshops to help inform landowners with land along major streams as to the availability of financial and technical assistance.

\* SWCD and NRCS public meetings by each county two to three years ago. Input from the public and interested stakeholders on natural resource concerns was used to develop strategic plans and allocate resources to address key natural resource issues.

## **Planned Outreach**

To continue efforts of encouraging protection of water quality in the basin, many events and activities are planned by JRBP and other organizations as information/education activities. These include:

\* White River Basin Forum - Formalizing a collective show of support for the Missouri-Arkansas White River Basin cooperative efforts, through encouraging the states, cities, counties, businesses and groups in the watershed to write resolutions or letters of support for the initiative. Written documents will then be collected, bound and forwarded to MDNR, Governor Carnahan, State and Federal legislators, and others, to show the public backing for those cooperative efforts.

\* Toll-free Water Quality Information Resource Line- 1-888-924-WATER is the number interested people may call to receive a free packet of water quality information and do's and don'ts for good water quality. It is an outreach outlet that is supported by the billboard campaign, radio and TV PSA's, a web site ([www.jrbp.smsu.edu](http://www.jrbp.smsu.edu)) and other outreach sources.

\* Billboard Campaign- Supported by local business partners, the nine billboard campaign reaches across the watershed with the JRBP clean water message "Help the rivers run clean." It also advertises the toll-free number for the water quality resource line. The campaign also encourages citizen involvement, and helps to create awareness of the importance of water quality.

\* Clean Water Kids- Successful, water quality education outreach program targeted to the watershed's fourth grade students. Give students a hands-on way to learn what a watershed is, what affects water quality and what they can do to be good environmental stewards.

\* Monthly Membership Meetings and Activities - Monthly meetings are held in various locations across the watershed to give all citizens the opportunity to get involved. The meetings are open to anyone interested, and are free to attend. Guest speakers and activities are a regular feature of the meetings and topics always relate to water quality.

\* A "kick-off" dinner in cooperation with MDC, USFWS, JRBP, NRCS, and SWCD to highlight the many programs available to the landowners in that watershed.

\* Mailings and news releases as needed, JRBP newsletters (*Current*) to JRBP's mailing list, incorporation of water quality articles in SWCD and RC&D newsletters, direct mailings to those requests from the web site, bill boards, and toll free number. Direct mailing to landowners in the three subwatersheds.

\* Tours & Demonstrations on well plugging, septic tank maintenance /clean out, and riparian corridor management.

\* Clean Water TV and Radio Public Service Announcements will continue to encourage television viewers and radio listeners to focus on water quality and its importance, remind them of water quality related dates, and call them to action.

- \* Lawn Care Field and Demonstration Day- Co-sponsored by NRCS, JRBP, University Extension, MDC and other groups - this event will teach people best management practices for lawn care, practices that benefit good water quality.
- \* JRBP Web Site- A professionally designed web site to encourage internet users to focus on water quality and its importance, highlight and inform them on good water quality practices, and remind them of water quality related events.
- \* River Rescue - A jointly sponsored river clean-up/float/fundraiser put on by the JRBP and the Ozark Mountain Paddlers. 1999's event cleaned up a section of the James River from Shelvin Rock to Hooten Town, raised awareness about water quality, and raised \$10,000 to aid JRBP projects. In 2000 a section of Finley River was cleaned up and again \$10,000 was raised to aid JRBP projects.
- \* Regional Environmental Conference 2001- Three successful regional conferences have preceded the 2001 conference - Clean Water Cruise in 1998, Managing Our Growth - Sustaining Our Future conference in 1999, and Business, Development, and the Environment: Profitable Investments in our Future in 2000.
- \* Conservation Weekend- 2-day event at Bass Pro where public learns about JRBP and other organizations.
- \* Urban Soil Test Rebate- Provide rebates to homeowners who soil test and receive recommendations on lawn care.
- \* Speakers Bureau- Organize and maintain a list of qualified speakers knowledgeable in water quality issues to provide to individuals and organizations that request water quality related speakers.
- \* Watershed Extravaganza- Free, family fun events who may not be the usual audience for water quality seminars, but do have an interest in learning about water quality in a fun and festive atmosphere.

Thousands of watershed stakeholders will be reached through the technology transfer activities listed previously. The message of the importance of clean water and being good water stewards will reach thousands of citizens. That message will raise their awareness level concerning water quality issues and in many cases cause them to inquire further and take steps on their own toward becoming better stewards of our streams, rivers and lakes.

Several organizations, groups, and individuals are considered stakeholders in this project. Many are fully aware of the intentions and goals of this project while others will be brought in as partners during the project. The long list includes: JRBP, NRCS, MDC, SWCDs, EPA, DNR, University Extension & Outreach, FSA, Watershed Committee of the Ozarks, the many local city & county governments in the watershed, Department of Health, SW MO RC&D, Stream Teams, Southwest Missouri State University, Drury University, US Fish & Wildlife, all private landowners, businesses, residents, and visitors in the watershed.

### **Monitoring & Evaluation Activities**

The assessment of the James River will be completed in the beginning of the project. Much work has already been done on this project, but much more is still needed. Data on the types of water

quality monitoring already completed in the watershed has been collected. More data is yet to be collected. This data will be analyzed for its content, and recommendations may be made as to what other kinds of monitoring is still needed. The goal of studying the water quality data is to determine or predict relative contributions of the pollutants from the different major sub-watersheds in the James River Basin.

GIS, GPS, and satellite imagery will be used as tools to help identify resource concerns throughout the basin. These tools can help pinpoint sites where significant potential for pollution contributions are being derived. Much of this work is currently under way by the NRCS GIS Lab at Lincoln University. Data such as land use and soils are currently available to help aid this project. Features like animal densities, waste spreading areas, stream riparian conditions, and others will be collected and used for the analyses. GIS can be used to make predictions of current watershed conditions against planned conditions.

Towards the start of the project, a Technical Work Group for the project will be organized to provide guidance, assistance, and quality assurance on technical matters. This group will be composed of a cross section of agency personnel that have a strong interest in the success of the project. Monitoring and evaluation methods will be one item the Technical Work Group will provide guidance on. They will also serve as advisors and assist with the assessment. This group will have a knowledge of the activities and characteristics of the watershed and be able to provide input on the assessment findings.

Another monitoring tool that will be utilized is Stream Teams. Formed in October of 1999, the JRBP Stream Team will initially be sampling two sites on the James River. Other teams will be trained to provide monitoring assistance within the three sub-watersheds selected in this project.

Applied conservation practices will be another means of monitoring success of this project. The project manager will be responsible for tracking the number and kinds of practices installed throughout the three subwatersheds through the many different programs available in the watersheds.

Before and after photos of resource concerns are a great way to document the success of individual resource concerns. These photos provide a visual tool to show the changes that can take place when a resource concern is addressed and corrected.

Interest and participation in the information/education activities will be an easy means of tracking the success of not only the event, but also the project. Monitoring the number of participants for meetings, tours, demos as well as tracking the number of newsletters mailed, hits on web site, phone calls, inquiries, etc... are all ways to evaluate the project's outreach and accomplishments.

Modeling will also be used to monitor the success of this project. Tentatively, we will use the WEND model, currently being used by the Natural Resources Conservation Service in other watersheds, to determine the effect of restoration projects on water quality. However, given the nature of computer technological advances, we are open to other modeling methods. Because the watershed is large and the population is growing quickly, we do not feel that in-stream monitoring would be a useful method to demonstrate the project's success.

The Project Manager and Watershed Coordinator will provide periodic progress reports to the JRBP, Technical Work Group, and Advisory Board.

### **Specific Water Quality Problems**

There are many water quality concerns within the James River Basin, as well as the three identified sub-watersheds. Phosphorus is the main pollutant that most agree is the major concern. Along with the phosphorus, other nutrients like nitrogen should also be considered a major concern. Another contributor to the concern is the amount of sediment being delivered to the water resource, especially through the many urban expansion projects ongoing in the basin. Testing by Dr. Jack Jones, from the University of Missouri, in the James River arm of the lake over the past 15 years has revealed

some interesting trends in the quality of water coming from the river. Phosphorus levels have significantly increased, Secchi disk readings have decreased, and Chlorophyll-a levels have increased. The result of these changes in quality indicators is excessive algae growth experienced in the reservoir, which is a major concern to all stakeholders in the basin. The impact of this poorer quality of water is a lower aesthetic value to the lake users. As a recent example, the lower sections of Flat Creek experienced a major algae bloom in 1998 that drew significant media attention. Compared to the other tributaries to Table Rock Lake, the James River contributes more phosphorus than any of the others that feed the reservoir.

### **303d List and Unified Watershed Assessment**

The 303d list shows that 58.5 miles of the lower James River is impacted by urban point and non-point sources. Projects like those sponsored by the JRBP, will help eliminate this section of the James River from the list by increasing the awareness of water quality issues in this section of the watershed. Educating the stakeholders in the watershed and obtaining public support for better stewardship of their water will ultimately result in better water quality. The recently adopted regulations on decreased phosphorus loading through waste water treatment facilities is a prime example of this public's support for better water quality. Financially assisted practices through the 319 project will also help eliminate this river from the list.

The Unified Watershed Assessment also notes reasons this watershed is high priority. Many of the items are simply characteristics of the watershed that cannot be altered (i.e. large drinking water supply population, 100% of HU in public water supply). Items like high animal unit density and biological impairments can be addressed through better land management practices through programs like 319, EQIP, state cost share, and MDC programs. Solutions to items such as urban point and non-point issues are discussed in the previous paragraph.

### **Agricultural Non-Point Source**

From the preliminary assessment of the basin, there are a few major agricultural non-point source issues that are a concern. Grassland type farming operations are the biggest component in the James River basin and three sub-watersheds. Beef operations are the primary industry and grass is their primary feed source. The grass is obtained through grazing during the growing season and through hay during the winter months. Typically, pastures are continuously grazed resulting in poor ground cover to prevent erosion and runoff. Planned grazing systems are promoted as both environmentally and economically sound practices. Very few farms within the watersheds utilize soil testing to guide their fertilization decisions. Also, many of these farms lie on the small tributaries where a riparian corridor is lacking and cattle have access to the stream. Many of these farms rely on the streams or springs for a water source since ponds are not a reliable water source. The contribution of animal waste in streams is a concern that needs to be addressed.

Although there are several dairies in the region, many operators have quit for various reasons. Many of these dairies have switched to strictly a beef operation. Of the dairies that remain in business, a few 18% have DNR approved waste handling systems, and only 1% have incorporated a planned grazing system to help distribute manures in a more even manner throughout the farm. The dairies that do have animal waste systems, generally spread the waste on nearby grass fields at a rate of 100-lbs. nitrogen/acre/year. Several poultry operations are present in the watershed with most of them in operation in the Flat Creek tributary (Barry County). Expansion of the poultry industry has slowed significantly in recent years. Again the waste (litter) is commonly spread on nearby grass fields (usually at 2-3 tons/acre/year) or possibly sold as a fertilizer source. Approximately 36% of the poultry operations have permits or Letters of Approval to operate. Each year, several requests are received for stacking sheds to store the litter and composters. The concern with both the dairies and

poultry operations is the over application of phosphorus from annual spreading on the same fields. Placement and timing of applications is also a concern. Beef feedlots are not a major concern within the basin, since very few are present. A few hog operations are present in the watershed but only a couple of major operations. Most are small operations with less than 25 head.

Cropland makes up only a minor portion (<2%) of the watershed. Many crop fields are located in larger, flatter river bottoms or on the flatter ridge fields. Wheat, corn, sudan, or forage sorghum are the major crops grown and many of the crops are either grazed or used for silage or haylage.

Horses are another enterprise, or hobby, that is significant in the region. Many residents around Springfield (in southern Greene, western Webster and northern Christian) live on lots that are 3-10 acres in size. Many of these residents have at least one or more horses and far less land than is normally suitable for the number of horses being maintained. Constant overgrazing is usually the result.

### **Urban Point and Non-Point Sources**

Another major concern with the number of rural homes in the watersheds is their treatment measures for household waste. Depending on the site and soil conditions, special measures are often needed to assure the success of rural individual septic systems. Unfortunately, many of the soils found in the James River watershed have limitations to properly treating waste. Poor treatment of the effluent and possible surfacing of the pollutants or leaching to the groundwater may result. One of the major causes of this failure and potential adverse impact to water quality is sludge buildup in the septic tank. In many counties, strict regulations have been enacted to assure newer rural homes will have the appropriate septic system installed. Still yet, proper maintenance is required for all types of systems.

A significant concern in the watershed is the effect of urbanization on water quality. The James River watershed has seen an increase in population of 20-25% from 1988 to 1998. The population explosion in the area has had detrimental effects on the James River. With more people moving in, developers have met their needs by building more homes and subdivisions. In turn, more people means a need for more businesses. All this development leads to an increased erosion potential and sediment delivery during the construction phase and then to increased runoff as the soil is replaced with roof area, concrete, asphalt, stormwater drainages, and lawns.

Of course with the added number of people, and visitors, a greater demand on sewage treatment has resulted. Although treatment facilities have been improved, more loading of phosphorus is placed in the river. Many professionals feel that this point source is the major contributor of phosphorus to the James River and Table Rock Lake. State legislation has been proposed and adopted recently that would require a significant reduction of phosphorus being released to the James River from some of the larger wastewater treatment facilities over the next eight years.

Additional homes and subdivisions also increase the number and area of lawns or well maintained grassed areas. These sites are typically overfertilized, mowed frequently, and compacted prior to lawn establishment. All three characteristics leads to excess runoff, often polluted. A soil testing program for the urban community would help reduce some of the pollutants- mainly phosphorus, coming from these urban settings.

### **Other non-point sources**

The *James River Basin Inventory and Management Plan* completed by MDC notes variable degrees of stream bank erosion along the lower James River, Flat Creek, and upper Crane Creek. Minor amounts of erosion is noted within Flat Creek while significant amounts were observed in Crane Creek along with poor riparian conditions. Selected portions of the lower James River itself have severe amounts of stream bank erosion.

## Watershed Coordinator

The duties of managing the proposed project for the James River will be split between two key individuals. Diana Sheridan, Executive Director of the James River Basin Partnership (sponsors of the 319 proposal), will serve as watershed coordinator for the project. Steven Hefner, NRCS, will serve as the water quality project manager. Responsibilities will be divided between these two individuals. Most of the information/education activities will be coordinated by Diana Sheridan. Many of the restoration activities will be organized by Steven Hefner. For all these activities, other individuals and organizations will provide technical support.

A Technical Work Group for the project will also be organized to provide guidance and assistance on technical matters related to the restoration and assessment activities. This group will be composed of a cross section of agency personnel that have a strong interest in the success of the project.

An Advisory Board will also be compiled to supply advice and guidance toward the direction of the project. This board will likely be composed of current members of James River Basin Partnership.

## Action Plan and Water Quality Goals

The first item that needs to be completed before proceeding with spending many dollars within the James River is a watershed assessment. This assessment process has begun but takes time to complete. An accurate assessment of where the non-point source pollutants are coming from is not an easy task but one that takes considerable analysis of current as well as predictive data. GIS will be utilized as much as possible to assist with this process. Several organizations will be providing input to help with this analyses of the watershed. Also, a task force made up of water quality expertise is being organized by DNR to help determine possible TMDLs for the James River watershed.

Several important information/education activities are planned to be implemented over the life of this project. For a listing of these activities, see page 3, under "Planned Outreach".

The conservation practice goals for this project are given in the following table.

TABLE 1 Restoration Goals of the 319 Project

PRACTICES	Targeted Sub-watersheds			
	Upper Flat Creek	Lower Finley/Elk Valley	Urban Target	Greater James R. Basin
Riparian Forest Buffer	40000 ft	40000 ft	10000 ft	20000 ft
Nutrient Management Plans- (Agri)*	8	5	--	2
Nutrient Management systems- (urban)	--	--	400	--
Septic Tank maintenance	--	--	15	--
Well/Cistern Decommissioning	4	4	4	3
Sinkhole Protection	7	7	7	4
Planned Grazing Systems*	2000 ac	2000 ac	500 ac	1000 ac
Livestock Exclusion from Woodlands*	400 ac	400 ac	50 ac	250 ac
Pasture Improvement/Establishment*	250 ac	200 ac	200 ac	100 ac

\* The goals reflect restoration that will be funded by other programs and tools that are available.

The overall goal of the project is to improve the water quality in the James River to a publicly acceptable level. Hopefully, the 58.5 mile stretch of the river will be removed from the 303d list. This is an optimistic goal considering the complexity, size of the watershed, rate of growth and urban

sprawl and number of stakeholders living within the watershed. A strong information/education campaign is crucial to the success of this goal.

### **Implementation Schedule**

This schedule is subject to revision. (See Table 1)

### **Funding Needs**

The estimated total project cost is \$ (depends on match from Becky S.). The amount of 319 funds requested is \$601,350. The non-Federal Match amounts to \$ (depends on match from Becky S.) which comes from the SWCDs, State Cost Share Program, landowner participation, the JRBP, private industry, local media, MDC and many others. The Federal contribution (Non-319) is around \$ (depends on match from Becky S.). Much of this comes from the EQIP program and NRCS.

The cost for restoration of the entire 930,000 acre James River watershed is practically impossible to estimate at this time. Improvements to reduce phosphorus from point sources, such as waste water treatment plants, alone will be a multi-million dollar project. Estimates for the non-point contributions will also be millions of dollars. After experience is gained through this project on the three sub-watersheds, a better estimate may be attainable.

Other potential future funding sources are identified as 319 Mini Grants, 104(b)(3) grants for monitoring, AgNPS SALT program, ISTEAs, EQIP education assistance minigrant, SWCDs, State Cost Share Program, Municipalities, landowners, JRBP, private industry, local media, MDC, EQIP, and NRCS, and others.