



City of Santa Fe, New Mexico

memo

Date: September 2, 2014

To: Buckman Direct Diversion Board

Via: Rick Carpenter, Water Resources & Conservation Manager *RC*

From: Alan G. Hook, Water Resources Coordinator Assistant *A.G.H.*

Subject: Update on the Santa Fe Municipal Watershed Management Program.

Background

In February of 2009, the City of Santa Fe (City) completed a 20-year watershed management plan to maintain reduced fire hazard within the municipal watershed and ensure a reliable water supply for the City's water utility customers. The Santa Fe Municipal Watershed Management Plan was subsequently adopted by the City's Governing Body through Resolution No. 2009-87 in September 9th, 2009. In 2013, the Santa Fe Municipal Watershed Management Plan was revised. This master plan provides a framework and recommendations for long term management, outreach, and funding for the Santa Fe Municipal Watershed. The plan addresses four areas critical to the maintenance of the municipal watershed: (i) vegetation management and fire use; (ii) water management; (iii) public awareness and outreach; and (iv) financial management. The key difference in the most recent plan is the concept of funding forest restoration activities using a Payment for Ecosystem Services model as a mechanism to fund prevention efforts against future threats, particularly of catastrophic fire, to the municipal water supply. However, instead of a specific line item fee on the public utilities bill, the investment in the Santa Fe Municipal Watershed Management Plan comes directly from the water utility customers' rate payer fees.

Vegetation Management and Prescribed Fire Use

Maintenance treatments are vital for future forest health and protection of the City's water supply within the municipal watershed. The Española Ranger District of the Forest Service has already burned slash piles within treated areas of the non-wilderness area of the municipal watershed as well as conducted broadcast prescribed burns on over four thousand acres to prevent fuel accumulation within this range of the municipal watershed. If approximately 1,000 acres are broadcast burned each year, the entire municipal watershed will be burned every 7 years.

- Prescribed fire in the treated areas of the municipal watershed, with 4 proposed burn entries (1 pile burn and 3 maintenance burns). The first entry with pile burns occurred between 2003 and 2013. Maintenance burns are proposed at three intervals between 2005-2012; 2013-2019; and 2019-2029;

- Continue current smoke management practices as well as public outreach;
- Evaluate piñon-juniper woodland density and soil conditions and develop recommendations for future management;
- Protect Southwestern white pine during prescribed burns;
- Monitor for cheat grass and other invasive species.

The portion of the municipal watershed located within the Pecos Wilderness contains at least 10 vegetation classes, from alpine grasslands to pine and oak with yucca and cactus. For the purposes of fire management, the Wilderness Area can be divided into two vegetation zones: (i) lower elevation (<10,000 feet) mixed conifer forests (comprised of Gambel oak, ponderosa pine, and piñon pine), and (ii) the upper elevation (>10,000 feet) spruce-fir dominant forests. While this division into two zones is more accurately described as a gradient, the two types can be used as general guides for fire regimes.

- No treatment in the 4,107 acres of spruce-fir forest
- Prescribed fire in approximately 2,900 acres of mixed conifer, ponderosa pine, and Gambel oak

The USFS is close to finalizing the publication of the final decision by the regional forester on the environmental assessment for the prescribed burning within the Pecos Wilderness plan.

Watershed Education and Outreach

Recently, the Santa Fe Watershed Association submitted their annual report for FY 2013-14 (please, see attachment 1) documenting the educational & outreach activities accomplished in the past year. 2013 and 2014 were difficult times to conduct watershed field classrooms and watershed hikes due to the on-going construction and completion of the municipal reservoir infrastructure improvements to Nichols Reservoir and now beginning in the fall of 2014 McClure Reservoir.

In conclusion, the City's Water Division is continuing the efforts that started in 2009 within the 20-year watershed management plan to maintain reduced fire hazard within the municipal watershed and ensure a reliable water supply for the City's water utility customers.

Attachment 1: FY 2013-14 Upper Watershed Education & Outreach Update.



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FY 2013-2014 Upper Watershed Education & Outreach Update

Work completed under Santa Fe's 20 year Municipal Watershed Management Plan approved by City Council September, 2009 (Resolution No. 2009-87)

Report prepared by the Santa Fe Watershed Association

July 31, 2014

The Santa Fe Watershed Association has been tasked with implementing education and outreach programs under the 20 year Municipal Watershed Management Plan in partnership with the City of Santa Fe, U.S. Forest Service, and The Nature Conservancy. ***Since fall 2010, the Santa Fe Watershed has served 3,813 participants in over 30,000 contact hours of Upper Watershed education programming.***

Over the course of the last three years, the Santa Fe Watershed has designed, implemented, and evaluated a variety of education programs and outreach materials. These are designed to increase awareness among a variety of audiences, both youth and adult, about forest and water management in the Santa Fe Municipal Watershed (Upper Watershed.) Most notably, the Santa Fe Watershed Association has implemented a successful program called *My Water, My Watershed* for Santa Fe Public Schools upper elementary students which has served over 3,000 local students thus far.

Outreach materials developed through this partnership have included the production of a 24 minute video about the project, stakeholder focus group meetings and phone surveys to understand public perception of the project, and the development of a citizens guide to understanding their watershed. Current deliverables include utility bill inserts, newsletters, and presentations to community and civic groups.

Education programs provide opportunities for citizens of all ages to explore and witness the work that has been completed and is ongoing in the Upper Watershed. For youth, our flagship program, *My Water, My Watershed*, is aligned with New Mexico science standards and benchmarks for fourth and fifth grade Santa Fe Public School students. In addition, we offer science monitoring programs for local middle and high school students. For adults, we coordinate watershed tours, including both hikes and van trips into the Upper Watershed, which are increasingly popular and always have waiting lists. Additionally, we offer a 30-hour program called *New Mexico Climate Masters* for adults.

In FY2013-2014, the Santa Fe Watershed Association offered 6 watershed tours (four hikes and two van trips) to 104 participants; 23 *My Water, My Watershed* programs to 588

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fourth and fifth graders, 4 middle school monitoring programs to 205 participants, and one *New Mexico Climate Masters* session to 10 participants for a total 907 participants served over 6,861.5 contact hours (participants X program hours.)

Program Effectiveness

Collecting evaluations, both written and verbal, are central to all of our programs. We encourage all watershed tour participants to provide us with feedback. For all of our youth education programs, we communicate directly with teachers, parents/guardian chaperones, and teachers aides to adapt to ongoing needs. Teachers are required to fill out a written evaluation after each program. Feedback is shared with all staff and volunteers involved in the program.

For our largest Upper Watershed education program, *My Water, My Watershed*, we collect pre- and post-assessments for each student. This assessment tests the student's knowledge in where the Santa Fe River begins and ends, understanding the definition of watershed, ways to conserve water, and the concept of an ecosystem. ***For the 17 classes participating in My Water, My Watershed in spring 2014, we saw an average increase in knowledge of the Santa Fe River watershed of 21%. The average pre-assessment score was 65% and students improved to an average of 86%.***

Here are just a few of the positive comments we have received through our evaluations:

"I wanted to say how much I enjoyed it! I learned a lot about its human and natural history, the renovation project underway at Nichols Reservoir and met some really interesting people—not least among them Bill Armstrong!" – Upper Watershed Tour Participant

"This is an excellent program to teach children about where our water comes from, its importance, and its environment. Being in the outdoors is so crucial for students. It enhances their intellectual, social, and emotional well-being. They love it!" – 4th grade teacher from Chaparral Elementary

"The program offered many great opportunities for the students. Educators were very responsive to students' needs." – 5th grade teacher from Turquoise Trail Charter School

"The educators were very passionate about the topics and knowledgeable about the watershed. They kept the students attention and interest in the classroom and on the field trip." – 4th grade teacher from Turquoise Trail Charter School

"Eileen is outstanding as a teacher. She really covers all 3 learning styles: visual, auditory, and kinesthetic. She is respectful and always communicates directions and expectations clearly to students. She is adept with management of children, knows her topic very well and knows how to engage children in the learning process." – 5th grade teacher from Wood Gormley Elementary

"Thank you! As always, this program was incredible" – 5th grade teacher from Wood Gormley Elementary

Program Challenges

Implementing outdoor education programs require adapting to ongoing changes in conditions whether it is weather conditions, transportation issues, or challenging classroom management issues. For this past year, in addition to our "normal" challenges, we at the Santa Fe Watershed Association were faced with two unexpected hurdles. The first of which was the lack of access into the Upper Watershed for education programs in fall. The second of which was bus availability.

As with previous years, the Santa Fe Watershed Association began making preparations for the 2014-2015 school year in the summer and by early August had already scheduled 26 *My Water, My Watershed* programs for the fall. In mid-August, the Santa Fe Watershed Association was made aware by City staff that there might be some access issues into the Municipal Watershed as a result of the construction in and around Nichols Reservoir. On August 22, the Santa Fe Watershed Association was notified that no *My Water, My Watershed* programs could occur in the Upper Watershed through May 2014 due to safety concerns from the construction company hired to complete construction at Nichols Reservoir. After alternative options to continue programming were exhausted, the decision was made in early September to cancel fall *My Water, My Watershed* programs.

This unexpected closure in the Upper Watershed led to a lot of extra staff time devoted to exploring alternative options. Considerable time has been spent building relationships with teachers throughout Santa Fe Public Schools and this setback caused fewer *My Water, My Watershed* programs to be implemented in the 2013-2014 school year. Access into the Upper Watershed was allowed for spring 2014 programs and we worked closely with the City to plan for as many days as possible for classes to occur in the Upper Watershed in this time period; however, we were not able to meet demand for these programs, we only had 17 programs in April and May 2014.

Another challenge with school programs turned out to be limited bus availability for spring programs. Due to spring break being relatively late, the dates available for spring programs were already more limited than in previous years. In addition, all Santa Fe Public Schools buses were booked for an almost two week time period due to National Dance Institute performances. This put a high demand on buses for all spring field trips district-wide. By March, most spring field trip dates had no Santa Fe Public School buses available. We dealt with this challenge by working with a private bus company that is able to transport Santa Fe Public School students. Although the costs were higher to use this private company rather than go through the Santa Fe Public Schools transportation department, we filled the buses to capacity and maximized the number of classes that could be run those days.

Upper Watershed Education Program and Outreach Descriptions:

My Water, My Watershed

My Water, My Watershed is an experiential, science-based program for fourth and fifth grade Santa Fe students to study and explore their watershed, learning about the complex relationships between living things and their environment. During a one hour pre-visit in the classroom, students are introduced to a short history of the Santa Fe River and learn the definition of a watershed. During the full-day field visit, students use their observation, questioning and data collection skills to explore the Ponderosa pine forest along with the Santa Fe River. In the one hour post-visit, students review and evaluate the data collected and reflect upon the new concepts learned. Exploring ideas for water conservation, students revisit the connections between the watershed, Santa Fe River, Rio Grande River, and the water we use in our schools, homes, and community.

Student Monitoring

Working with Santa Fe middle and high school students, student monitoring occurs at a study site between Nichols and McClure Reservoirs in the Upper Watershed. Each class is provided with a pre-visit to the classroom to map out the Santa Fe River Watershed and introduce field collection techniques. During a field trip to the Upper Watershed, students collect data including water quality variables such as pH, dissolved oxygen, and temperature; benthic macroinvertebrates; and canopy cover.

Upper Santa Fe Watershed Tours

During a 5 mile roundtrip hike or van trip into the Upper Santa Fe Watershed, experts from the Santa Fe Watershed Association, the City of Santa Fe, and U.S. Forest Service lead participants on a visit to Nichols Reservoir, beaver lodges and dams, and cover topics such as the history of Santa Fe's drinking water supply, how the reservoir systems work, forest thinning and healthy forest ecology, the role of beavers in our watershed, and other topics about the ecology of the Santa Fe Watershed.

NM Climate Masters

The purpose of a NM Climate Masters course is to provide 30 hours of in-class programming and a field trip to the Upper Watershed to participants over a 10 week time frame. The programming is designed to provide ideas of how we can reduce our carbon footprints through a variety of ways including transportation, energy conservation, waste, consumption, food, and water issues. Upon completion of the program, participants create and implement a 30 hour service project in the community. This project has two objectives for the participants: 1) Serve as a positive messenger of how we as individuals and a community can reduce our carbon footprint. 2) Incorporate the learned material into a small-scale, community service effort.

Utility Bill Inserts

To specifically target Sangre de Cristo Water Division customers, two informational bill inserts are included in water bills annually. Each of these inserts describe basic information about the watershed and its management and include topics such as defining the concept of watersheds, the role of prescribed fire in forest management, the dangers of drought, and smoke management. These inserts reach all Sangre de Cristo Water Division customers directly. In FY2013-2014, the inserts targeted smoke and the wildland urban interface.

Community Presentations

To reach a variety of audiences within Santa Fe, we present information about the Municipal Watershed Management Plan to community groups such as civic groups or faith-based groups. Rather than starting a new series of presentations within the community, we are able to deliver this material to already established groups with members from across Santa Fe. This past years we delivered programs to groups such as the Rotary Club, Master Naturalists, and the Santa Fe Farmers Market Institute.

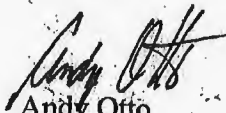
Citizen's "Guide to Protecting our Watershed"


The Citizen's "Guide to Protecting our Watershed", is modeled after "The Orleans Blue Pages." This book will be used as an educational guide for classrooms and be handed out at local events to the public. It will also be distributed to SFWA membership, to Chamber of Commerce membership, and through various community organizations. 3,000 copies of this booklet will be printed and distributed through the community. Final edited version has been submitted to City staff for final approval.

Deliverables	# completed	# of people served
My Water, My Watershed programs	23	588 students
Middle/High School programs	4	205 students
Watershed tours	6 (four hikes and two van trips)	104 participants
NM Climate Masters	1	10
Utility bill inserts	2	All Sangre de Cristo water consumers
Community presentations	6	100

A total of 907 participants were served in over 6,861 contact hours (participants X program hours) through Upper Watershed education programming offered by the Santa Fe Watershed Association in FY 2013-2014.

Thank you for the opportunity to serve the citizens and the City of Santa Fe.
Sincerely,


Andy Otto
Executive Director


Eileen Everett
Education Director

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