Jackson Blue Spring and Merritt's Mill Pond Basin Management Action Plan

Technical Meeting Summary
Tuesday June 23, 2015
6:30 PM (Central Time)
Jackson County Extension Auditorium, 2741 Pennsylvania Ave, Marianna, FL 32448

Attendees

John Alter, NWFWMD Governing Board	Karl Kressman, Rancher
Brad Austin, JBS Cattlemen's Association Board	Matt Lollar, University of Florida
Tom Batey, SWCS	Cheryl Mackowiak, IFAS
Tiffany Busby, Wildwood Consulting	David Malloy, Citizen
Angela Chelette, NWFWMD	Josh Mitchell, DCP Associates
Kevin Coyne, FDEP	Serina Rocco, FDACS
Holly Edmond, FDACS	Andrew Rutledge, NWFWMD
Vicki Fuqua, Citizen	Allen Scheffer, Florida Farm Bureau
Brittanie Gloyd, FDACS	Travis Shannon, DRMP
Ken Godfrey, JBS Cattlemen's Association Board	Leland Smith, ECT
Terry Hansen, FDEP	Edd Sorenson, Cave Adventures
Ray Hodge, Southeast Milk	Lacey Starr, FDEP
Betty Johnson, Landowner	Chad Taylor, JBS Landowner
Paul Johnson, Landowner	Hugh Thomas, FDACS
Mary Killingsworth, Citizen	Becky Trott, Citizen
Robert Killingsworth, Citizen	John Trott, Citizen
Steve Klelch, Cattle & Hay	

Welcome and Opening Remarks

Tiffany Busby welcomed everyone to the Jackson Blue Springs Basin Management Action Plan (BMAP) meeting. She thanked the Jackson County Extension Service for the use of their meeting room. The participants introduced themselves and the entity they represent.

BMAP Process

Terry Hansen reviewed the BMAP framework and process. He stated that the state monitors water quality around the state and compares the results to water quality standards. In most cases, the standards are based on whether the waters are "fishable and swimmable." If the waters do not meet the water quality standards, such as in the case of the Jackson Blue Spring and the spring run, then they are considered to be impaired by the Florida Department of Environmental Protection (DEP). In the case here in Jackson Blue Spring, the waters are impaired for too many nutrients and specifically for nitrates that are causing algal mats to form in the waterway. When impairments occur, the state sets a number—a total maximum daily load (TMDL)—where the waterbody can meet its intended use. The BMAP is the plan for how the waters will meet the TMDL and its intended use.

Terry noted that the BMAP is not a remediation plan; it is a restoration plan, which is a much longer process. Terry showed a map with the BMAP boundary. The area includes the spring and the surface watershed that contributes to the Mill Pond. The boundary encompasses the ground water area that influences the spring. Our goal is to reduce the nutrient footprint in that area in order to restore the spring. Terry added that the restoration will not happen overnight. What happened in the past that

contributed to the impairment is old news. DEP wants to focus on what we can affect, which is reducing the nutrient footprint in the future.

Terry explained that BMAPs are adopted by DEP through a Secretarial Order and are enforceable. The BMAPs themselves are reviewed annually and updated every five years. As implementation proceeds, Terry noted that DEP looks for measurements of success. Terry described the regulatory framework for the BMAP process and noted the Florida Watershed Restoration Act. Terry added that the PowerPoint presentation is already posted on the DEP website for future reference.

Terry then described the TMDL for Jackson Blue. The TMDL report for Jackson Blue was dated January 2013 and described that the spring and Mill Pond were impaired for excessive algae. The TMDL is to achieve 0.35 milligrams per liter (mg/L) of nitrate as a monthly average; the goal of the BMAP is an unimpaired waterbody.

Terry explained that for agricultural sources of nitrogen, the obligation of commercial producers is to enroll in the Florida Department of Agriculture and Consumer Services (FDACS) best management practices (BMPs) or to monitor for water quality. This process benefits the producer by providing a presumption of compliance with water quality standards and provides eligibility for cost-share funding. Overall, BMP enrollment and implementation is the solution path for agriculture.

Review of Past Action Items

Terry reviewed the action items from the previous meeting in July 2014 that included the following: 1). Flow and nitrate relationship; 2). Landfill monitoring; and 3). DEP arsenic study information. Terry then proceeded to follow up on the flow and nitrate relationship item.

Flow and Nitrate Relationship

Terry showed a chart that described the historic ground water concentrations with the red line indicating the concentrations in the Shangrila Spring and the blue line the concentration in Jackson Blue Spring. Terry showed a map of the well locations that were measured with the yellow markers indicating their location. Terry showed a graph of the well concentrations between 1982 and 2014. Then he showed a graph plotting the spring flow (discharge) and the nitrate concentration and the data did not show a relationship between the two. Then Terry showed a comparison graph of Wakulla Spring in Wakulla County. Terry noted that the red line on the graph is the concentration in the Wakulla Spring vent and the blue line is the spring flow. He added that the values really bounce around in the Wakulla data. In Jackson Blue Spring, the concentration value remains relatively constant. Terry also showed graphs of Rainbow Spring flow and concentration where the concentration has been steadily rising. Terry noted that DEP doesn't like to see rising nitrate concentrations, so we are glad to see a steady Jackson Blue concentration and not an increasing concentration.

Terry noted the Wakulla ground water system is not a good comparison to the Jackson Blue ground water system as the Wakulla system is very complex with lots of tunnels and conduits. The Jackson Blue system is more similar to the Rainbow Springs system. Karl Kressman asked what time of year is the peak concentration in Wakulla as there could be seasonal peaks there. There are some cattle run out by the airport. Terry replied that he could not comment on what the sources are in Wakulla as he has not worked on that basin. John Trott asked if the Rainbow Spring is getting worse. Terry responded that

the nitrate concentrations are increasing and noted that there are more people living in that springshed than here. John asked how much agriculture is located in the Rainbow Spring area. Terry replied that Rainbow Springs is predominantly an agricultural basin, but agricultural land uses are decreasing there and urban land uses are increasing. John asked what the average time the water takes to reach the spring. Terry noted that everyone should be cautious when talking about the average water age from a spring. The average age represents a composite water sample that includes the most recent rainfall and older ground water. In Rainbow Spring, the average water age is about 15 to 17 years. However, Terry added that you can't say the water is 17 years old. What you can say is that the average total travel time is about 15 to 17 years and that is an important difference.

John asked if Terry was saying that Rainbow Spring is similar to Jackson Blue Spring, but they are getting worse and we are not. Terry replied that it's a relatively good situation here. The thing to consider is that the nitrate concentration in Jackson Blue Spring is 3.5 mg/L and we want to reach 0.35 mg/L. It's good that we don't have a lot more people coming in to add to the loading.

Edd asked to see the well site map and stated that when the Blue Springs Working Group was meeting several years ago, the recharge area was different than the one currently shown on the map and asked why the area has shifted. Terry answered that there is the spring contributing area for the main spring and the boundary used is based on the best information we have—the Northwest Florida Water Management District (NWFWMD) studies. There is also the surface contributing area to the Mill Pond. Both those areas are included on the map.

Edd commented that for the Shangrila and Blue Spring, the springshed definitely travels to the northeast based on where the tunnels go. For Twin Caves, Hole in the Rock, and Center Hole, the tunnels travel to the southeast and they have little water flow. Edd asked who decides what area gets added. Terry responded that it is important to keep in mind that the springshed is not only based on the conduit systems but also based on karstic flow. Edd responded that the volume from the karstic flow is negligible.

Karl questioned why the springshed boundary ends at the state line with Alabama. Terry answered that there is a section of the springshed that extends into Alabama, but we can only work on the area where we have authority. Even so, DEP is still talking to the State of Alabama but we have no authority there to implement a Florida TMDL. Terry added for Edd that if you draw the flow lines there is karstic ground water flow that comes out at the springs, so it is important to account for that flow and also for those loads.

Karl commented that in the north end of the basin it doesn't rain as much so it stays drier, so that area is likely not to contribute as much as the areas further south. Terry replied that we understand that. We try to look at the nitrogen footprint and look in the springshed for activities that will benefit the springs. Karl added that fertilizer is expensive, so agriculture can't afford to put out any more than the plants need. Terry replied that, yes, the commercial agriculture's obligation is to enroll in BMPs and to show FDACS that you are implementing BMPs. It's that simple. When we work on BMAPs in the Suwannee area, we have dairies there with more manure than a regular cattle operation or growers that triple-crop areas on center pivot. So there we really try to work on those BMPs as they have a lot more load potentially coming from their kinds of activities. Karl stated that last July at the meeting, the DEP staff

were pointing their fingers at those of us in agriculture. Karl noted that if he fertilizes before a rain, he has lost that money. The agricultural numbers that were presented previously were way off. Terry replied that he apologizes if anyone felt that DEP was pointing fingers at you. DEP wants to reduce the nutrient footprint and if you are implementing BMPs, you are good and Terry said he will congratulate you. Terry encouraged the commercial growers to talk to the agriculture folks. Terry stated that in the BMP process, there is a fair and balanced approach. Karl added that whether a producer works with livestock or row crops, we all do a pretty good job. Terry stated that we are trying to make people aware of the things you do to help this situation. Hugh Thomas stated that FDACS isn't looking at the last seven to 10 years, and that previous history is affecting what is happening now and we know that. Terry added that we want to focus on now and in the future, not on the past because we know we can't do anything about the past. We are not here to pin responsibility on anyone but we are trying to move forward. Terry asked if he had answered Edd's question. Ed responded no.

Edd asked why the recharge basin changed and the "red box" area was added to the contributing area. Edd stated that every time he talks to someone, something has changed and he doesn't know why. Terry noted that the NWFWMD has taken water quality samples from 2004 through 2014 and those data show the system has the same concentrations as the spring vent. Most of the wells have concentrations between 3 mg/L and 4 mg/L and they are fairly uniform.

East Jackson Landfill

Terry showed a map of the East Jackson landfill location and showed a table of the nitrate concentration at the compliance wells at the site and a background monitoring well. Terry stated that there is not a lot you can do with an active landfill because it is already in place, but we will continue to monitor the ground water quality at the site. Terry noted that we do have data from the landfill area, but the concentrations are generally below 2 mg/L. So the landfill is a nitrogen source; the concentrations are above the TMDL concentration but below the average ground water concentrations. It is not a hot spot.

Terry added that the landfill is out of compliance for iron and manganese, and the NWFWMD is working with them to get them into compliance. Overall, the landfill is a source, but not a significant source. This is not a surprise as the landfill ages. Edd asked if the nitrogen is mostly organic or inorganic coming from the landfill. Terry responded that he was not sure. Karl asked what causes the changes as the landfill ages. Terry responded that the degradation of the material inside the landfill can cause the changes or the interaction of the various materials with each other inside the landfill. Most landfills try to take hazardous materials, like bleach and antifreeze, out of the waste stream but it is not totally effective and those chemicals and interact and cause problems in the long term. Karl asked how you correct that situation. Terry replied that it is a difficult remedial action and very expensive to fix. Terry noted that these problems are outside the scope of the BMAP process. There are older solid waste practices that have changed and may not be acceptable now.

Arsenic Study

Terry explained that a report was issued by DEP in June 2005 that described an arsenic study that began in 2003 in cooperation with the Florida Department of Health (FDOH). Terry noted that the health standard for arsenic is 10 micrograms per liter (ug/L). FDOH was involved because arsenic is a definite human health issue. The study included taking soil samples and the installation of ground water wells.

The investigation results were that the arsenic source within the Mill Pond area remains undiscovered. There are several potential sources, included a naturally occurring source associated with the soil type called glauconite, but none of the possibilities have been confirmed. There is no smoking gun source that has been identified. Terry added that the report is available on-line.

Overview of Potential Monitoring Actions

Dye Tracing/Vent Sampling

Terry reviewed some proposed monitoring actions that included dye tracing, cave vent sampling, mill pond sampling, and real-time water quality monitoring devices. Terry noted that we don't have a good handle on the travel times in this springshed, so more data would help to understand the system and the importance of the sources.

Terry explained how dye tracing works and how the breakthrough curve is measured at the spring. Terry described an example of a dye tracing study in Wakulla Springs in 2004. Terry noted that it often takes many days for the dye to show up in the springs. The DEP is currently working with the NWFWMD to figure out the best place to insert the dye. Terry noted that the Wakulla travel times were quite fast and may not be as fast in the Jackson Blue system. Terry added that the start time for the dye study is under discussion but may be done this fall.

Terry reviewed that the dye is traced at the spring vent and the carbon packet that attracts the dye is retrieved. Vent water quality sampling is also planned.

Mill Pond Sampling

Terry explained that the DEP will be sampling for fauna and flora on a quarterly basis as well as measuring nutrient concentrations. This sampling will begin this summer. This sampling is intended to monitoring changes as well as BMAP effectiveness. Vicki asked if this effort will begin in the next few months. Terry responded that, yes, it will begin as soon as this summer and definitely this year. Edd commented that the Mill Pond is getting choked with eel grass and that seems to make the algae problem worse. Terry replied that Lyngbya is a native plant species and is not invasive. This plant likes high nutrient conditions, high temperatures, and long residence times. The best way to control it is to reduce its food stock (which is nutrients), and that is the goal of the BMAP. Terry added that we can't guarantee that when we reach the TMDL that the Lyngbya will go away, but we are trying to address the problem.

Paul Johnson stated that this year, the bloom in the Mill Pond is the worst ever observed. The pond is jammed up with the plants. Paul asked if anything can be done to clear it out. Also, the apple snails aren't coming out. Terry replied that this problem is why the Mill Pond is considered to be impaired and is not "fishable and swimmable." We are trying to fix this problem, but it will not happen by tomorrow.

Real Time Water Quality Monitoring

Terry stated that he emailed out the link today to the website where the real time water quality monitoring results can be reviewed. This link was also listed in his presentation. Terry noted that the sensor uses ultraviolet light to work and the sensor may be moved to a better location. Becky Trott stated that the nitrate levels are usually not that low and some of the data that were shown on the

website. Terry replied that it is possible that the sensor was not accurately recording. Cheryl Mackowiak stated that she checked the data from today's measurements and the results were usually between 3.3 and 3.4 mg/L, which is consistent with the overall dataset.

Review of Nutrient Source Inventory Loading Tool Process

Terry described the Nutrient Source Inventory Loading Tool as the process to assist with determining the potential sources of nutrients to the ground water. Terry reviewed the example of the results for the Kings Bay/Crystal River BMAP, primarily in Citrus County. Terry stated that DEP is still refining the tool for the Jackson Blue system so the example provides an idea of the types of data that are reviewed and the data sources for the analysis.

Terry added that the numbers for agriculture are the numbers we know the least about. The agricultural data is a "guesstimate." Terry noted that DEP will be meeting with local agricultural representatives to review the numbers for this area and will work with the Florida Farm Bureau to set that up.

Terry reviewed the process to estimate nitrogen loads to ground water. The process includes estimating the inputs to the land surface; applying attenuation factors based on the types of transformation that is expected to occur; applied an aerial weighting factor based on the rate of recharge; and feedback from local stakeholders. Terry reviewed the nitrogen cycle and how nitrogen is attenuated before it reaches ground water. Terry also reviewed how recharge rates vary depending on the geology of the area.

Terry reviewed how atmospheric deposition and wastewater treatment facilities sources were estimated in the Kings Bay/Crystal River analysis. Terry also reviewed how septic tanks, urban fertilizers, and golf course sources were estimated. Terry provided an overview of how farm fertilizers were estimated. He stated that local input is very helpful to refine the numbers as there is a lot of local awareness of who is doing what. Livestock populations were derived from the U.S. Census of Agriculture, a study produced by the U.S. Department of Agriculture. Based on these estimates, livestock waste was also estimated. Terry noted that DEP understands that some of this information is proprietary, so there is no need for names and numbers, but an estimate of the overall livestock numbers in the basin is the objective.

With all of these data, the annual average loading to ground water was estimated for the various source categories. These numbers reflect the attenuation factor and the recharge rate weighting factors that were applied. Terry added that in the example of Kings Bay/Crystal River, the area is mostly urban, so the biggest source is septic thanks. Terry reiterated that for agriculture the solution path is BMP implementation. For urban fertilizers, it helps to have a fertilizer ordinance and then think about if we need to do something more to address that source. The approach is to look at the source categories and focus our resources on the most effective actions. Terry noted that a future meeting will include a presentation on the nutrient source inventory for the Jackson Blue Spring. In the meantime, we need to plan a smaller meeting to work on the agricultural numbers and to get local feedback.

Potential Actions for Homeowners

Terry also reviewed the actions that homeowners can take to reduce their nitrogen footprint. Terry stated that septic tanks are not bad, and a properly maintained system works great while an improperly maintained system does not. Terry encouraged homeowners to think about lawn fertilizers and yard waste.

Edd asked if there is a BMP-type manual for homeowners. Terry replied that there are the Florida Friendly Landscaping guidelines. He added that educational campaigned targeted to homeowners are also helpful to raise awareness. Edd noted that over time, farmers have become much more educated on the importance of proper fertilizer use but homeowners don't receive that same kind of information.

Terry added that DEP has the green industries program to educate the professional lawn services, and in urban areas that can be helpful, but the use of commercial lawn services may not be as common in a more rural area. Kevin Coyne noted that DEP is trying to work with counties on educating homeowners. Karl noted that the agricultural communities are being forced to use the BMPs, but asked what program will monitor homeowners. Terry replied that DEP works with the county and looks at the potential sources. We work together to think about county policies and educational programs. BMPs are required but they are designed to help both the producers and the environment. In places where we have a solution path, we will work on those sources.

Hugh noted that Wakulla County passed an ordinance requiring additional performance from septic tank systems but they had some challenges with those and they did monitor those systems. Terry replied that they learned a lot from that experience. Terry added that FDOH is responsible for permitting septic tanks and it's important that they treat bacteria for human health concerns. It's the drainfield that produces the nitrogen and FDOH has a study underway to come up with a better treatment system for nitrogen.

Edd stated that DEP should understand that the other systems like Rainbow and Wakulla are different than Jackson Blue Spring and we don't want to compare apples to oranges. He added that there are few septic tanks in the recharge area. There are few septic tanks on the Mill Pond except for at one end. Terry replied that there may be a small quantity of septic tanks but to remember that every nonpoint source contributes. The DEP tries to be fair and equitable in the solution paths and we want to work with people on the solution paths. DEP is not promoting a Wakulla County-like septic tank ordinance. We want people to take action, even if it is small.

Edd asked about monitoring. Terry replied that more monitoring is needed, so we have a better handle on the flow paths. Edd stated that he needs to talk to DEP about the coils and the vent tubes in the Mill Pond. Terry stated that he would follow up with Edd on those items.

Karl noted that if you backed up 35 years, there was a lot of agricultural activity along the Mill Pond. There were cattle that used the Mill Pond. Karl added that a lot of that former cattle land is now pine trees. At that item, there used to be big, beautiful fish in the pond, even though there were a lot of cows. Now most of the cows are gone and there are houses. It's easy to see what happened. Terry replied that the residence time in the pond is an issue and no one is saying that agriculture is the problem. Karl replied that it seems like it's strictly urbanization and we can't change that. Terry responded that everyone needs to understand their responsibility. We need to focus on the future and moving forward to get better water quality; that is the best we can do.

Vicki asked when the eel grass was planted. The rotting vegetation is a big problem. There was discussion about the eel grass problems. Brad Austin asked if DEP is reaching out to the county. Terry replied that the DEP has been in contact with Jackson County and that will continue. Terry noted that tonight there was a Jackson County Board of County Commissioners meeting, so that was a time

conflict for the county staff to attend this meeting. Terry added that it is the local folks that will make the loading changes, and DEP can't make this happen by themselves.

Vicki commented that more advanced notice of the meeting is needed. Terry replied that they will do better next time with advanced notice of the meeting. Paul requested that more effort be giving to getting the county staff and local health officials to attend the meeting. Paul added that this was a very good meeting and it cleared some things up for him.

Karl stated that the cattle numbers presented at the previous meeting were way off and DEP needs some new numbers. Terry responded that DEP is working on that. One of the main issues is that there aren't good data sources. Karl responded that they want DEP to have the right data. Kevin replied that DEP hears that statewide. Karl stated that he lives along the border with Alabama and he worries about their impact. Terry responded that this is a long-term process and we need to get started on the sources here in Florida. Karl asked if chemical treatment would work. Terry responded that chemical treatment would just be a salve to the problem and that the loads from the springshed have to be addresses. Karl asked if there is concern about phosphorus and potassium. Terry responded that there is limestone underlying the area and that tends to bind phosphorus and potassium. Therefore, it's nitrogen that tends to pass through and be the problem; to the best of our knowledge, its nitrogen that is really important to water quality. Paul asked if there is anything that can be done short-term to clean up the pond. Terry replied that type of problem is usually in the purview of the Florida Fish and Wildlife Commission. Perhaps they could be invited to discuss this problem and the potential options at a future meeting.

Karl asked how long it would take to know the new fertilizer guidelines. Cheryl responded that they are working on some research right now related to fertilizer guidelines.

Steve Klelch asked when the enrollment process would take place for commercial growers. Hugh replied that FDACS will be coming out to the area and they will be increasing their staffing. Hugh introduces Tom Beatty to the group. Tom Beatty asked when the next meeting will be held. Terry responded that the next step would be to have a producer-specific discussion; Terry asked about the timing for such a discussion. Karl replied that the harvest starts in mid-August, so it would be helpful to have it before then. Terry suggested that late July might be a good time to review the agriculture numbers with the producers.

Terry noted that DEP wants 100 percent agricultural enrollment in BMPs and wants everyone to start enrolling. Hopefully, this will help with eligibility for cost-share monies and DEP is always looking for willing participants to test pilot approaches.

Adjournment

The meeting adjourned at 8:45 PM Central Time.

Action Items

- Terry---At a future meeting, include a presentation on the nutrient source inventory for the Jackson Blue Spring.
- Terry--Plan a smaller meeting to work on the agricultural numbers in the nutrient source inventory and to get local feedback.

- Terry—Follow up with Edd to talk to DEP about the coils and the vent tubes in the Mill Pond.
- Terry—Work on providing more advanced notice of the meetings.
- Terry---Work on getting the county staff and local health officials to attend the meetings.
- Terry—Invite the Florida Fish and Wildlife Commission to discuss the eelgrass problem in the Mill Pond and to discuss potential management options.