

Sustainable Water Resources Management: a conceptual plan
for restoring and protecting the water resources of the Peace Creek Watershed near Winter Haven, Florida

The City of Winter Haven has long realized that water plays a special role within the community. With 50 lakes inside or touching the City, and being at the top of both the Peace River watershed and the Floridan aquifer basin, it is critical that the community use water for public supply and natural resources before it leaves the system. To some degree, this circumstance exists for all of the communities within the Peace Creek watershed. The unique characteristics of this area require a special approach.

In January, 2009 Winter Haven hired PBS&J to help develop a Sustainable Water Resources Management Plan. The primary objective of the plan is to proactively protect and enhance water resources for long-term *human and environmental* use. The backbone of the plan is an interconnected network of lakes, canals, wetlands, aquifers, and 'nature parks', designed to store water long-term to meet future needs for water supply, water quality, flood protection, and the preservation of natural resources.



Because Winter Haven and the Peace Creek watershed are located at the headwaters of both the surface water and groundwater systems, water resources must serve all uses before it leaves the watershed. Historical alterations such as the construction of the Peace Creek Drainage Canal, the connection of lakes for navigation, and declines in the Floridan Aquifer from regional pumpage, have reduced water levels in lakes and the underlying aquifers by approximately 10 feet. The ability to recharge the lakes and aquifer has also been compromised by altering the land for urban development. This area of high aquifer recharge historically helped maintain water levels and water quality in the lakes. Restoring the hydrology of the watershed to increase the local storage of water is critical to meeting the long-term water needs of the area. It changes the thinking from 'getting rid' of water, to treating water as a special resource.

Figure 1. 1856 military map (J.C. Ives), showing Lake Hamilton and the wetland slough and broad floodplain south of the lake, flowing to Peace Creek.

This conceptual plan proposes an investment in the watershed's *natural* infrastructure (lakes, wetlands, recharge areas, and aquifers) as a means to manage water as opposed to *engineered* infrastructure (reservoirs, pipes, far away water supplies). Using natural infrastructure to provide multiple benefits results in a less costly, more efficient water storage and delivery system for all future uses. In contrast, the present hydrologic system is primarily operated to 'get rid' of water for flood protection.

To assist in developing the plan, PBS&J convened a number of meetings with key stakeholders in the community, including City and County staff, members of the City's Lakes Advisory Committee, concerned citizens, the Lake Region Lakes Management District and staff from the Southwest Florida Water Management District. The stakeholders provided key insights into how water historically moved through the watershed and how alterations within the watershed have changed the hydrology. One of the key realizations of the meetings is that the City of Winter Haven and the Peace Creek watershed are poised to grow significantly in the next decades. Once these alterations occur, many opportunities for using the existing natural infrastructure may be lost.

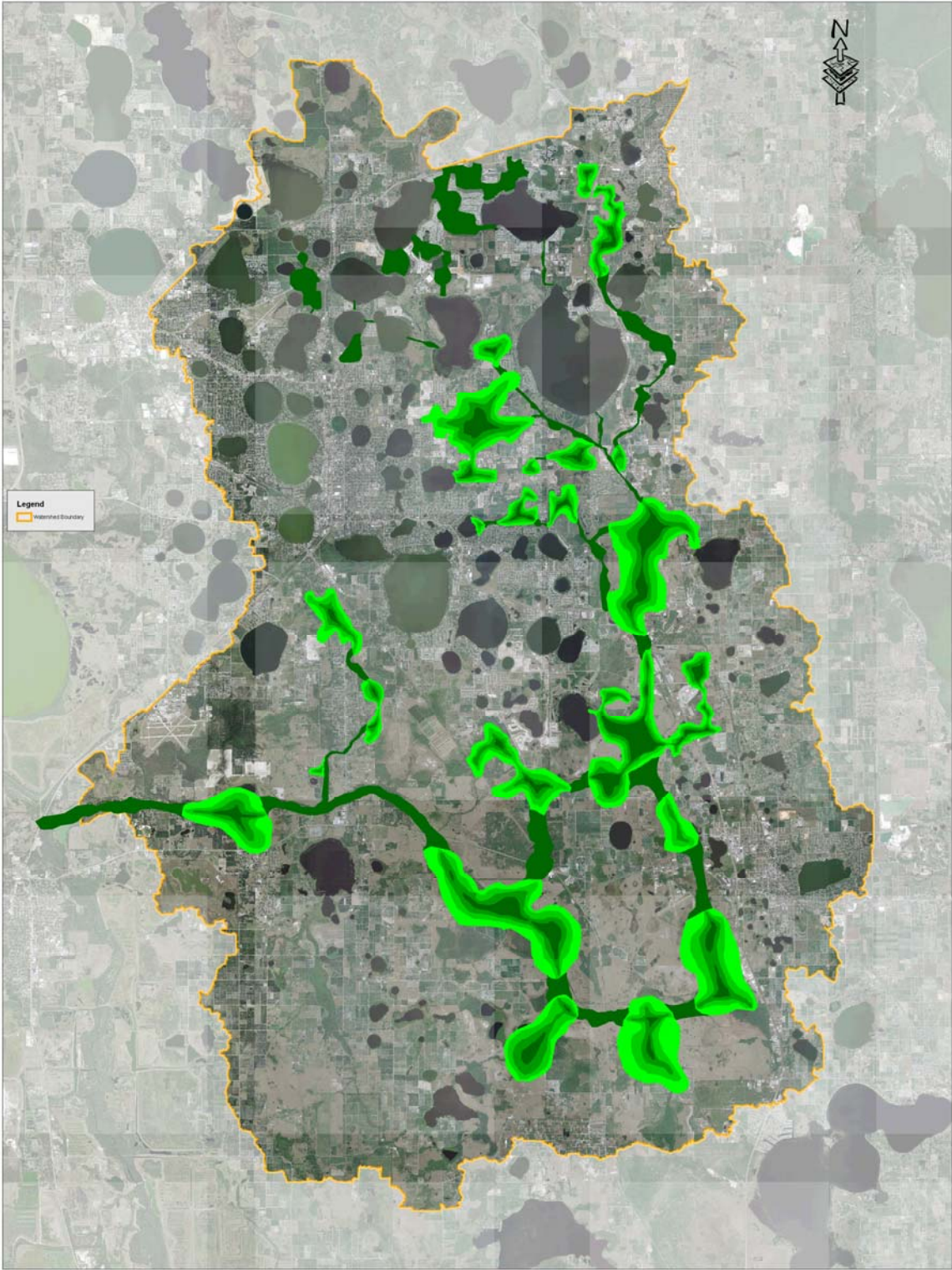
PBS&J and the University of Florida, Howard T. Odum Center for Wetlands, used the information provided by the stakeholders to develop a conceptual plan for increasing water storage throughout the watershed (**Figure 2**). Some of the key components of the plan include:

- *In the upper portion of the watershed, which encompasses the downtown area of Winter Haven and the ridge areas, rainwater will be directed to rain gardens, swales, and small isolated wetlands to recharge the surficial aquifer and provide water quality treatment. Instead of reuse water discharging directly away from the system to the Peace Creek, it will also be allowed to infiltrate into the soil. This will increase water levels in the surficial aquifer, increase groundwater flow into the lakes, increase water levels in the lakes and increase recharge to the Floridan Aquifer.*
- *The middle portion of the watershed, currently dominated by the Peace Creek Drainage Canal and the Wahneta Farms Drainage Canal, will be transformed into a series of sloughs and floodplains intended to slow the movement of water through the system to provide water quality treatment and recharge. During peak rainfall events, it will be designed to discharge floodwaters very quickly.*
- *The lower, downstream portion of the watershed, encompassing the "southern loop" of the Peace Creek Drainage Canal and the downstream portions of the creek leading to the Peace River, will be transformed into large water storage areas and broad floodplains to manage large hydraulic loads of water and provide flood attenuation.*

Regional Benefits

Because the Peace Creek watershed is at the top of the groundwater and surface water systems, it is critical that the water resource needs of the community and natural resources are met before the water leaves the system. It is also significant, however, that restoring the watershed also provides benefits to all downstream interests. Presently, the Peace River and many lakes within the watershed do not meet established minimum levels due to groundwater pumpage and hydrologic alterations. This is one of the reasons that the Southern Water Use Caution Area was established. By restoring this critical headwaters area, the long-term process of improving base flows to the Peace River, providing more water for lakes, and restoring recharge to the Floridan aquifer for all downstream users can begin.

Figure 2. Conceptual Restoration Plan of the Peace Creek Watershed



Implementation

With an ever changing economic and political climate, new partnerships between government and private interests will need to emerge. This conceptual plan establishes the framework for these partnerships. The plan is poised to use existing governmental tools as an economic incentive to insure that water resources play a key role in our future.

The primary tools needed to begin implementing the plan include:

- Land use planning with water as a key consideration;
- Creating incentives for future development to fully consider water management;
- Mitigation banking to create water storage;
- Partnerships with land owners and governmental agencies so that floodwaters can be stored in historically wet areas; and
- Using water storage areas as amenities for development with a series of interconnected nature parks with trails, boardwalks and open space.

The conceptual plan includes all or parts of the following communities: Winter Haven, Auburndale, Lake Alfred, Haines City, Lake Hamilton, Dundee, Lake Wales, Bartow, Eagle Lake and Polk County. Each of these communities relies on water resources for the future of its economy. Each community also has a role in insuring that water is a key consideration in how we move forward in the future. Downstream communities along the Peace River, Charlotte Harbor and all that use the Floridan aquifer will also benefit.

Sustainability

In many communities, the definition of sustainability includes economic and cultural sustainability in addition to that of natural environment. Although restoring the Peace Creek watershed provides local and regional benefits, the proposed plan also enhances economic and cultural sustainability. By incorporating restoration projects as landscape, open space and recreational improvements, the plan creates improved economic development and cultural opportunities. The interconnected series of water storage areas throughout Winter Haven and the Peace Creek corridor would become nature parks with trails and scenic corridors. These amenities will help attract economic development to the region as well as provide world class natural resource based recreation. This unique combination of natural systems management with future economic development is what makes the plan especially viable during changing economic times.

One of the underlying principles of the plan is this: if we do not move decisively to protect water today, the future costs for water supply, water quality and flood protection will have more of an economic, social and environmental impact in the future.

More detailed designs of the various elements of the conceptual plan will be presented to the community in a final report that will be completed in April, 2010. For more information, please contact Mike Britt, Director, Natural Resource Division, City of Winter Haven, at mbritt@mywinterhaven.com, or 863-291-5881.