

estuarine habitats, and water supplies before and after state regulatory and reclamation programs;

- Effectiveness of existing programs in avoiding, minimizing, mitigating, or compensating for cumulative impacts; and
- Benefits and implications of establishing buffer areas within the 100-year floodplain of major surface waters in the basin.

The study focused on the major causes of stress to the ecology and hydrology of the basin, including rainfall, groundwater withdrawals, and land use changes associated with urban growth, agriculture, mining, and other activities. Preliminary results of the *Cumulative Impact Study* were presented to the public at a series of workshops throughout the basin. The final study was published January 26, 2007 and is available from the DEP's website at www.dep.state.fl.us/water/mines/prcis.htm.

Major Findings of the Cumulative Impact Study

There is no single, predominant cause of impacts to water resources in the Peace River basin. Urban development, agricultural operations and mining have all contributed to the basin's decline. Evidence of these impacts can be seen through many indicators:

- Approximately 343 miles of streams and associated floodplains were lost in the basin during the study period from the 1940s through 1999.
- During this same period, the basin sustained a 38.5% reduction in wetland acres, a loss of about 136,000 of the original 355,000 acres.
- Approximately 31,000 wetland acres were lost after 1979 despite the existence of more stringent regulations.
- Native upland habitats declined from more than 834,000 acres in the 1940s to fewer than 243,000 acres in 1999, a 71% decrease.
- Floridan aquifer levels in the area have declined by 20 to 50 feet.
- Surface water augmentation from mineralized groundwater (high in dissolved salts) used for irrigation and freeze protection has adversely affected Punta Gorda's public water supply.
- The impacts of phosphate mining on landform and hydrology are found in the four sub-basins in the northern basin where mining occurs.
- Urbanization had the heaviest impacts in the northernmost and southernmost sub-basins and is expected to expand.
- Agricultural activities caused significant impacts on water resources throughout the Peace River basin; these impacts are now mostly noted in the central and upper southern portions of the basin because of the land use changes to mining and urbanization in the upper sub-basins.

As noted earlier, Chapter 2003-423, Laws of Florida, required an evaluation of establishing buffer areas in the basin. Buffers are the most effective means of flood protection because they prevent placement of incompatible land uses within flood-prone areas and ensure that development does not alter natural patterns of water movement and storage. They also provide natural habitat and wildlife corridors and contain wetland areas that serve to filter floodwaters and other runoff, thereby protecting downstream water quality.

In order to secure any buffer area, there are environmental, economic, legal ownership, and land use considerations that must be taken into account. The study discusses the establishment of buffers

both by regulatory means, such as using buffers as mitigation for wetland impacts, as well as non-regulatory approaches, like land acquisition and dedication of conservation easements.

A summary of the *Peace River Cumulative Impact Study* as well as a copy of the entire report are available on DEP's webpage at <http://www.dep.state.fl.us/water/mines/prcis.htm>.

Peace River Basin Resource Management Plan

Chapter 2003-423, Laws of Florida, also charges the DEP to prepare this resource management plan for the Peace River basin, which was developed with assistance from the Southwest Florida Water Management District and a stakeholder group consisting of representatives from local governments, regional water suppliers, regional planning councils, the mining industry, agriculture interests, development groups, environmental organizations, and fishing interests within the basin. The plan describes the key characteristics of the Peace River basin, summarizes the major impacts to area water resources along with their causes, describes existing resource management programs, and recommends actions necessary to avoid, minimize, mitigate or compensate for cumulative impacts in the basin.

Based on the *Cumulative Impact Study*, this management plan identifies 22 major impacts to the surface and ground waters, wetlands, fisheries, aquatic habitats, and water supplies of the Peace River basin caused by agriculture, phosphate mining, urbanization, and climate. Impacts range from the more obvious ones noted in the previous section to more subtle changes such as the loss of spring habitat, reduction in base flow in the upper parts of the river, and shifts in fish species due to mineralization.

Urban centers (Lakeland, Auburndale, Haines City, Winter Haven, Bartow and unincorporated Port Charlotte) are currently confined to the northernmost and southernmost parts of the watershed. However, residential, commercial, and industrial development is spreading slowly but surely throughout the entire Peace River basin, including the areas of Fort Meade, Zolfo Springs, Bowling Green, and Arcadia. The infrastructure required to support this development is bringing with it more stormwater runoff from roads and parking lots, additional wastewater treatment and discharge or reuse flows, higher demand for public water supply, large-scale clearing of native lands, and other consequences of growth that threaten the basin's water resources. Major east-west and north-south transportation corridors are being planned that could bisect the basin.

Management Plan Recommendations

The Peace River basin still contains significant floodplains that provide habitat for many wildlife species; natural forest stands; wetland areas that filter runoff and protect water quality; natural storage and detention of floodwaters; and protection for drinking water supplies. In order to preserve the remaining critical ecosystem and, equally essential, restore damaged areas vital to sustaining this growing area, its people and its economy, this management plan recommends specific actions to improve the environment and quality of life in the Peace River basin.

Among the most important of these recommendations are those to expand or expedite critical existing programs, like the aquifer recovery strategies in the Southern Water Use Caution Area and for minimum flows and levels in the basin. Others call for new actions that the DEP and Southwest Florida Water Management District can undertake immediately under their existing authorities. Several recommendations call for significant, multi-agency policy shifts. The complete list of

recommendations is set forth in Table 5.1 on page 44 and discussed in detail in Chapter 5. Of these recommendations, five priorities for new efforts stand out:

1. Develop an acquisition plan and funding strategy for the Peace River Basin through collaboration of local, state, and regional conservation land acquisition entities to assure a coordinated and equitable approach.
2. Develop a proposal to ensure adequate funding for the Nonmandatory Mine Reclamation Program to fund reclamation targeted at specific water resource benefits in the basin.
3. Jointly review DEP and Southwest Florida Water Management District environmental resource permitting in the basin to determine whether permitting criteria, special basin rules, or other regulatory strategies should be enhanced to minimize cumulative impacts more effectively.
4. Consider combining the Environmental Resource Permit and Conceptual Reclamation Plan approval processes into a streamlined and more protective, comprehensive phosphate mining authorization to enhance environmental protection and restoration.
5. Work with the Southwest Florida Water Management District and area local governments to evaluate, plan and initiate financing for the necessary environmental infrastructure to assure sustainable water supplies and improved water quality in the Peace River basin.

Management Plan Implementation

The DEP proposes to implement a series of actions, some in conjunction with partner agencies, to address cumulative impacts in the Peace River basin. The actions are set forth according to the timeframe during which they will be undertaken and follow from the recommendations noted above and set forth in Chapter 5.

This implementation plan itself is outlined in Chapter 6. It is, by design, dynamic and intended to be continuously improved as better information about basin hydrology and ecology becomes available. Several of the proposed actions are beyond the resources of any one agency and require collective action by various agencies and stakeholders in the basin. These agencies and stakeholders must effectively coordinate—and hold each other accountable—for implementing the plan’s recommendations and action steps; monitoring their progress; and refining, adapting, and developing new actions as circumstances demand.

The *Peace River Cumulative Impact Study* graphically illustrates the causes of decline in the Peace River basin. This resource management plan sets forth actions necessary to begin reversing the decline and preserving this critical ecological area for future generations. It can only be accomplished through the concerted efforts of all stakeholders in the Peace River basin.