

PROSPECTS FOR SOUTHEAST LEE COUNTY

PLANNING FOR THE DENSITY REDUCTION / GROUNDWATER RESOURCE AREA (DR/GR)

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The Density Reduction/Groundwater Resource (DR/GR) designation was applied to most of southeast Lee County, Florida in 1990 to protect the area's shallow aquifers and reduce the County's population capacity. The 83,000 acres of the southeast DR/GR host rural neighborhoods, limerock mines, and active farms. The land also contains valuable ecological and hydrological features including panther habitat and public supply wells.

Since the designation of the area the pressure to mine and build new residences has been increasing. In the fall of 2007 the Board of County Commissioners initiated a 14-point Action Plan addressing critical mining, traffic, and land use issues in the DR/GR. As part of the Action Plan, Lee County commissioned a major planning effort that includes four related parts: a mining truck impact evaluation, an integrated surface and groundwater model, detailed ecological mapping, and a land-use study. Dover, Kohl & Partners (DKP) headed the project team. Incorporating broad public input, the plan for the DR/GR attempts to define the proper balance of uses for the future of the critical area.



Mining operations, ecologically-critical lands, and residences are in close proximity in the DR/GR.

DR/GR PLANNING PRINCIPLES

A series of conservation, development, mining, and transportation principles were created to guide policy decisions affecting the DR/GR area. Shaped from the input received during workshops in April of 2008, these "Planning Principles" embody a clear vision for the future of the DR/GR.

CONSERVATION PRINCIPLES

- **Large-Scale Ecosystem Integrity Must Be Restored and Maintained**
Acquire and restore lands that can connect existing corridors and conservation areas. Protect larger stretches of natural lands instead of small isolated wetlands in the midst of existing mining.
- **Maintain Viable Watersheds**
Protect groundwater resources in southeast Lee County by analyzing development impacts with integrated surface and groundwater modeling.
- **Retain and Improve Ecologically-Responsible Farming**
Agriculture is a productive and traditional use of DR/GR land. New crops and improved farming practices can keep agriculture viable and reduce its impact on adjacent conservation lands. Local food production could reduce dependence on carbon-intensive, long-distance food supply chains. Land that is farmed is a valuable bank for future conservation efforts.

MINING PRINCIPLES

- **Create a Meaningful Map of Preferred Mining Areas**
Create maps that serve as predictable guides to approvals of new mines in the DR/GR. Plan for limerock mining in increments of time. Don't concentrate fill-dirt mines in the DR/GR.
- **Stick to the Traditional Mining Corridor**
Limerock mining is a high-disturbance activity whose effects on the surrounding area can never be completely mitigated. Minimize the impacts of mining on valuable watersheds, residential areas, and the road system by concentrating mining activity in the traditional Alico mining corridor. Fully utilize the limerock resources in existing disturbed areas before spreading out into more pristine environments.
- **Design Before You Dig**
The active extraction period of a mining site comprises a small percentage of its life. Ensure that post-mining land uses and site design are appropriate to their location and to the needs of the community.

DEVELOPMENT PRINCIPLES

- **Reallocate Development Rights; Create Sustainable Settlements**
DR/GR land is too valuable to waste on inefficient land-use patterns. Keep new residential development away from preferred mining areas to prevent conflicts. Compact and connected mixed-use communities should be the standard in the DR/GR.
- **Live Lightly on the Land**
Adverse human impacts on DR/GR lands should be minimized. Encourage cluster development to reduce the cumulative impact of human settlement.

TRANSPORTATION PRINCIPLES

- **Anticipate Higher Fuel Costs**
The rising price of fuel may affect all aspects of the construction industry, as well as the day-to-day life of average citizens. Plan future mining and residential uses in the DR/GR with rising transportation costs in mind. Explore alternative sources of materials for roads and construction as virgin sources become more difficult to obtain.
- **Manage Speed and Vehicle-Miles-Traveled**
Enforce speeds in the DR/GR to reduce mining truck and residential traffic conflicts. Focus mining uses along the existing road network to reduce the amount of miles traveled for transport. Create small mixed-use centers near existing communities to reduce traffic for daily needs and services.
- **Transportation Projects Must Follow Land Use Policy**
Think carefully before concluding that road widening is the only transportation solution. Begin tailoring existing roads for multi-modal use.

Land Use Concepts



Existing citrus groves surround isolated wetlands.



Default DR/GR policies allow agriculture to become ten-acre ranchettes.



A better way: DR/GR densities could be concentrated into a compact form.

Land in the DR/GR has been subject to a residential density cap of one unit per ten acres since 1990. Rural ranchettes of five to ten acres in size form subdivisions within the DR/GR. Yet, compact development can replace land-consuming ranchettes on agricultural parcels. This concept is illustrated on the left for the roughly ten square miles of land known as Old Corkscrew Plantation, which extends from SR 82 to south of Corkscrew Road. The site is now an active citrus grove.

If this site were developed under the existing DR/GR regulations, home sites would be spread across the landscape, eliminating large-scale agriculture. The same number of units can be constructed in compact form on a fraction of the acreage while providing some commercial and employment opportunities along SR 82. Such a community would typically require a sewers or a collective septic system. Small-scale, community-supported agriculture could be nearby while commercial-scale farming continues on the periphery. Historic flowways could reconnect the now-isolated wetlands.

On large tracts of land, allowable development rights can be shifted and concentrated fairly easily through the standard zoning and development review processes. When parcels are smaller, this shifting requires a transferable development rights program. Lee County has such a program for wetlands which could be expanding to allow transfers from sensitive uplands as well. Potential locations for receiving TDRs, and constructing compact, mixed-use communities were recommended by the planning study.

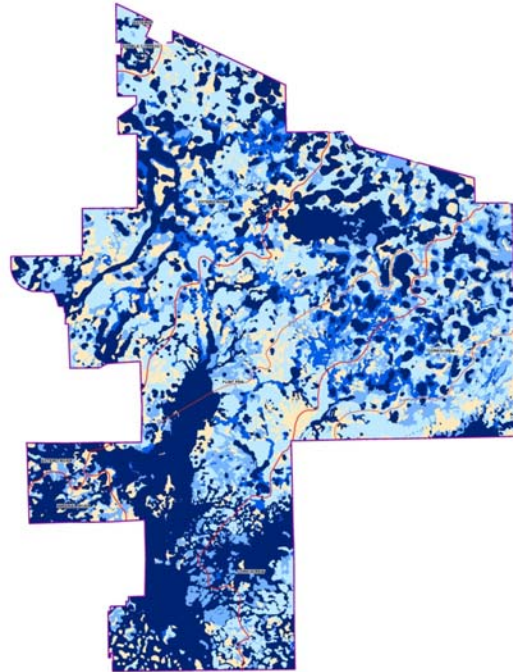


Utilizing a transfer of development rights a hamlet could be formed at the location of an existing country store.

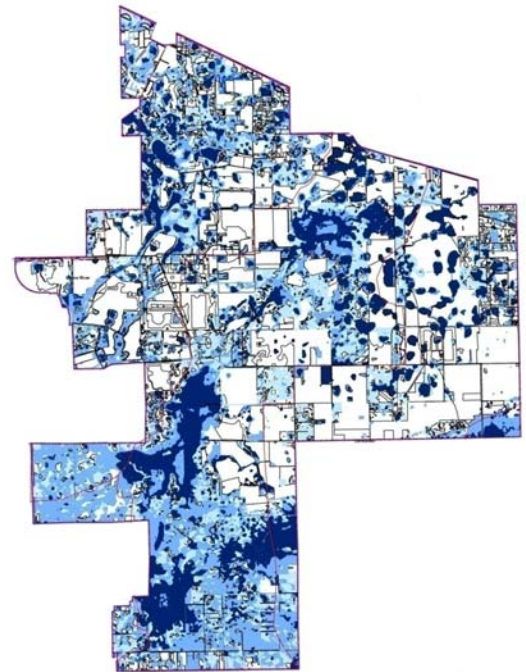
Hydrological Concepts

The significant role of the DR/GR in water resource functions has been documented by the numerous studies conducted over the last three decades. Three major hydrological systems traverse the area, including the headwaters of the Estero River, the Flint Pen Strand, and the Corkscrew Swamp. The DR/GR is one of the most important ecological areas within southwest Florida due to water resource functions, flowways, and key habitat areas.

Shown on the right, approximately 86% of the DR/GR were formerly wetlands. While only 46% are wetlands today, most of the lost wetlands were converted to wet farm fields which could be restored. Mining, however, presents an irrevocable conversion.



Historic hydropatterns in the DR/GR shown in shades of blue from most wet to least.



Current hydropatterns in the DR/GR.



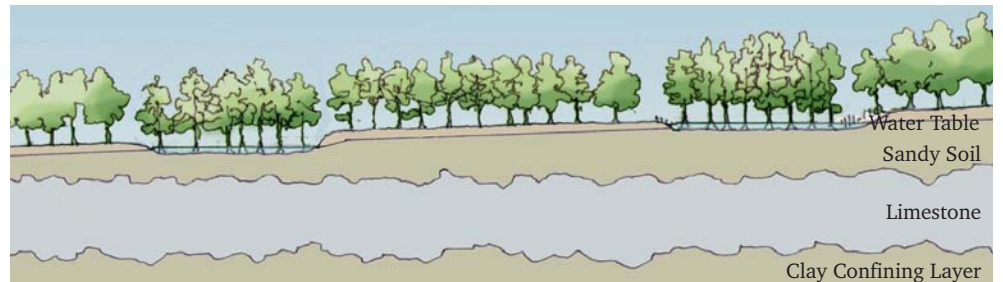
A flowway of cypress trees stretches toward an area of limerock mining.



Mining provides a critical resource but is a high-disturbance land use.

Water Level Impact of Large Mining Pits

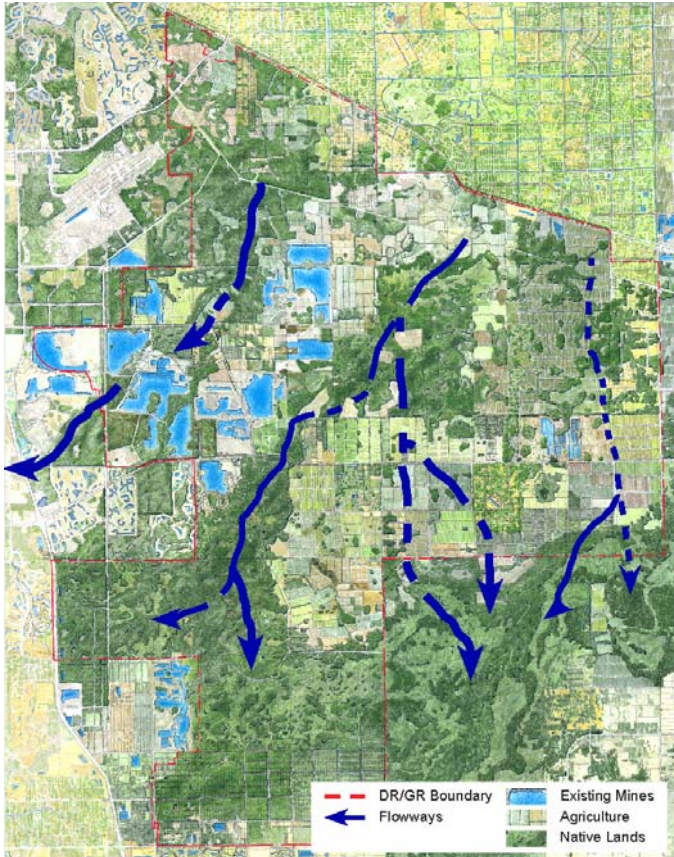
BEFORE: Natural conditions before mining. The top layer of soil is the root zone of wetlands and uplands. Immediately below is a sandy layer that extends down to the major limestone layer. The sand and limestone layers together form the surficial or water table aquifer; water flows underground through this aquifer. Below the limestone lies a thick layer of clay that restricts movement of water to other aquifers that lie deeper.



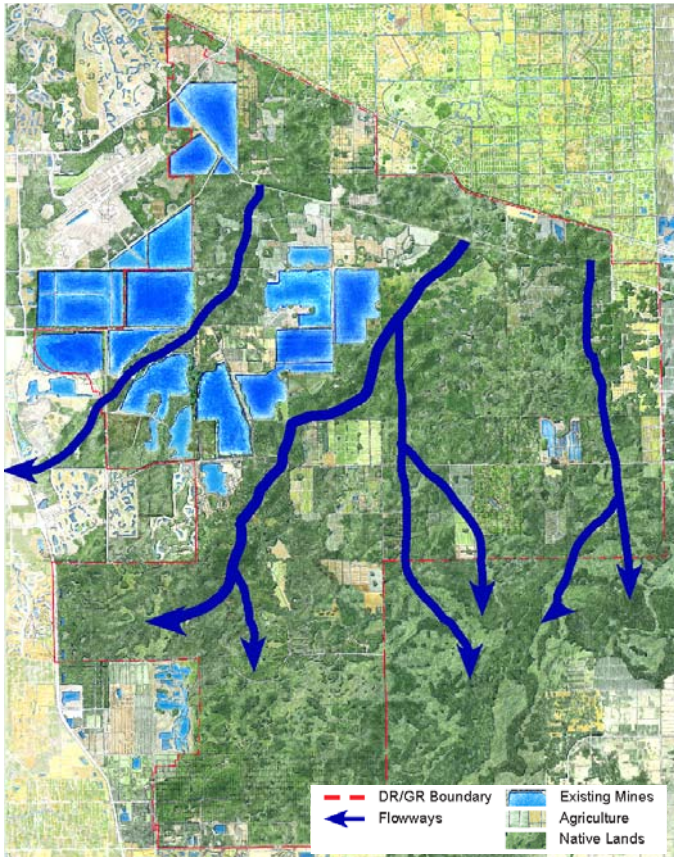
AFTER: Within the mine pit, all layers have been removed to the bottom of the limestone. Under natural conditions, groundwater levels tend to slope downhill roughly matching the ground surface above. However, when pits are dug on land that slopes slightly, the water level in the pit will stabilize at the level of groundwater at the lower end of the pit, drawing down groundwater levels especially toward the upper end of the pit. Draw-down effects make it difficult to preserve flowways and isolated wetlands near and within mining pits.



The Recommended Future Scenario



Approximate existing conditions in the DR/GR area.

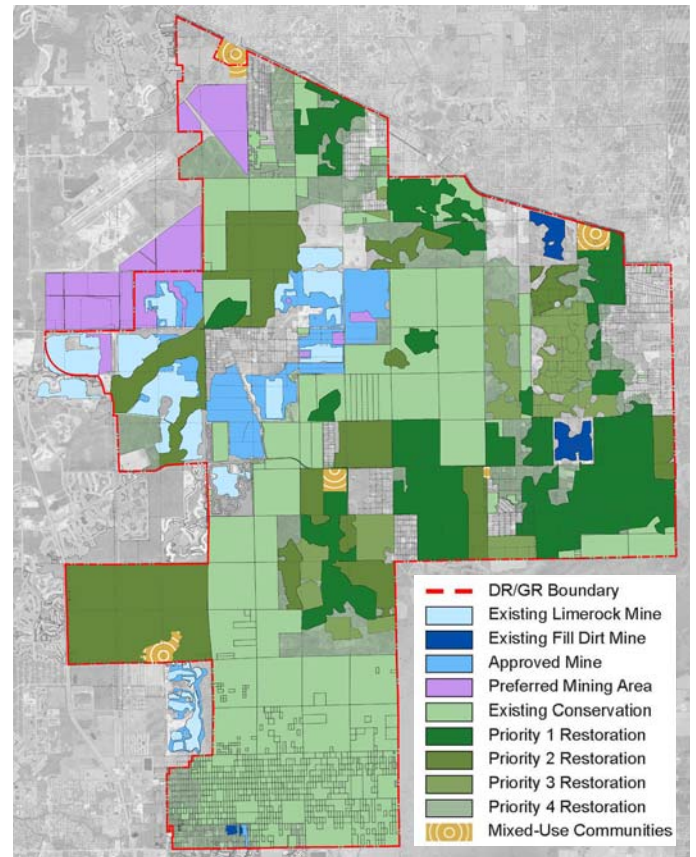


Illustrating the full implementation of an ambitious, long-range restoration strategy as proposed by the recommended scenario.

Three scenarios for the future of the DR/GR were presented to the Lee County Board of County Commissioners in September of 2008. The Board instructed the DKP team to proceed with comprehensive plan and land development regulation amendments to limit additional mining approvals to only the traditional Alico Road corridor in the northwest portion of the site. This decision was in keeping with the scenario recommended by the DKP team and illustrated on the left.

This possible future scenario provides limestone rock in excess of projected need to 2030, yet strives for the greatest natural resource benefits. It offers the best opportunities for flowway restoration and increased water storage. By keeping limerock mining near the traditional Alico Road mining corridor, less-impacted portions of the DR/GR to the east and south can be the focus of a long-term restoration strategy to benefit water resources and habitat protection. Hydrologic impacts of large mine pits will be less consequential where water levels have already been lowered by existing mining.

Shown below, Priority 1 restoration lands would begin to link flowways together. Priority 2, 3, and 4 lands would further complete the system. Except for the most critical flowway reconnections, these lands can remain in agriculture. Eventually they would be acquired and either converted to agricultural uses that are more consistent with water storage or restored to native habitat.



Specific mining and restoration lands in the recommended scenario.