Comprehensive Wildlife Habitat Protection Program for Pasco County: Critical Linkages

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Objectives for Today

- Discuss history of Critical Linkage development, and current status
- Review scientific literature relevant to the criteria for defining Critical Linkages
- Assess the characteristics of each Critical Linkage
- Summarize the rationale for the proposed widths and configurations
2000 - Settlement Agreement requiring, among other things, that Pasco County:

- Initiate a study to assess appropriate mechanisms for establishing wildlife corridors
- Amend the Comprehensive Plan to establish measures to protect wildlife habitat
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Background

- Glatting Jackson was hired to address the wildlife habitat components of the Settlement Agreement
- We convened a Technical Advisory Committee, held 2 public workshops, and reviewed our conclusions with the Citizens Advisory Committee
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**Background**

The Technical Advisory Committee prioritized:

- Biological diversity
- Riparian linkages
- Enhancing existing conservation lands
- Large mammal conservation
- Ability to withstand natural processes, i.e. fire, flood, hurricane, etc.
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Background

We used existing GIS data including:

- Biodiversity hotspots
- Hydrography
- Aerial Photography
- Existing conservation land boundaries
- Historic land use
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Background

Ultimately, we defined:

- Critical Linkages
- Ecological Planning Units
- Agricultural Reserve
Background

Critical linkage locations and widths were:

- Defined through analyses of these data and scientific literature, and other examples of wildlife corridor protection across the state
- Reviewed with the TAC, and
- Presented at 2 public workshops
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Background

Critical Linkages ranged from 550 to 2200 feet in width depending on the length between existing conservation lands.
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Background

These corridor widths were selected based on similar objectives that resulted in policies and regulations in:

- Lake, Orange, Seminole and Sarasota Counties,
- for the Wekiva, Econ and Tomoka Rivers
Public Lands in Pasco County
Critical Linkages – ranging from 550 feet to 2200 feet in width
Our initial study was accepted by the BOCC in March 2002.

Comprehensive Plan changes in 2007 included special protection for Critical Linkages.

We have recently refined the boundaries of the Linkages based on more precise aerial photography and GIS data.
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Scientific Literature Database Review: Critical Linkages

- Conducted review of current scientific literature regarding wildlife corridors
- Consistent with the 2002 study
- Analyzed state, national, and international research; applied global concepts to Pasco County
Wider linkages are better (i.e. Beier et al. 2008; Sinclair et al. 2005; Lee et al. 2004; Bennett 2003)

- Increased avian diversity (Darveau et al. 1995; Dickson et al. 1995)
- Decreased edge effects, greater diversity of habitat and species diversity (Bennett 2003)
- Provide valuable connections and breeding habitat for avian forest specialists (Shirley 2006)
Preservation of riparian habitat and adjacent forest cover, not just narrow riparian buffers (i.e. England and Rosemond 2004; Houilahan and Findlay 2004; Semlitsch and Brodie 2003; Willson and Dorcas 2003)
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Scientific Literature Database Review: Critical Linkages

- Comprehensive analysis outlined studies with recommended riparian buffer widths from 325 - 5250 ft

- Negative edge effects are biologically significant up to 985 ft in terrestrial and 165 ft in aquatic systems (Environmental Law Institute 2003)
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Scientific Literature Database Review: Critical Linkages

- Widths based upon definitive studies by Brown and Schaefer (1990a and 1990b)
- Studied buffer zones for wildlife on Wekiva and Econlockhatchee Rivers
- Evaluated minimum home ranges for species by habitat type
- Determined that 50% of wetland species accommodated in a 550-foot buffer (1100 feet total in width)
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Scientific Literature Database Review: Critical Linkages

Recommendations in Brown and Schaefer studies:

- Maintain a buffer that is, at a minimum, 1100 feet wide

- Any portions of the river/ wetland system that extend beyond the 1100-foot buffer are included, along with an additional 50-foot upland buffer
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Scientific Literature Database Review: Critical Linkages
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Scientific Literature Database Review: Critical Linkages
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Scientific Literature Database Review: Critical Linkages

- Studies by Brown and Schaefer were adopted in Lake, Orange, Seminole, and Sarasota Counties and applied to the Tomoka River by SJRWMD.
- Studies were also the basis for the recommended 550’, 1100’, and 2200’ corridor widths.
- Modified studies to account for:
  - variability among multiple corridors
  - lack of conservation lands adjacent to corridors.
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Scientific Literature Database Review: Critical Linkages

- Modified Brown and Schaefer studies to account for lack of conservation lands adjacent to corridors
- Establishing buffer zones adjacent to habitat reserves needed to protect wildlife value, especially in urbanizing landscapes (Rodewald 2003)
Modified Brown and Schaefer studies to account for variability among multiple corridors

- Core areas that are farther apart may need wider linkages; especially to accommodate wide-ranging mammals (Harrison 1992)
- To link large reserves with contrasting habitats, corridor must be wide enough to encompass suitable habitat for species that occur in each reserve (Bennett 2003)
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Scientific Literature Database Review: Critical Linkages
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Scientific Literature Database Review: Critical Linkages

- New technological and analytical tools allow us to quantify habitat selection and movements can approach corridors more holistically (Chetkiewicz et al. 2006)

- GIS continues to be a tool to make landscape-scale decisions on wildlife linkage(s); regional approach to consider numerous variables at once (Beier et al. 2008)
Current trends in scientific literature, consistent with the 2002 study, include:

- Corridors: wider is better
- Corridors must provide suitable habitat for wildlife; encompass home ranges of large mammals
- Corridors especially necessary in urbanizing areas
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Summary:

Corridors between conservation areas enhance the viability of the conservation areas themselves.
Wider corridors are better because:

- They are more resilient to natural disturbances
- They are less vulnerable to incompatible uses along the edges of the corridor
- They include a greater diversity of wildlife and plants
- They are more easily managed
The 550, 1100, 2200’ approach is justified because:

- The concept has been sustained in previous administrative processes
- The corridors also protect wetlands and the 100-year floodplain
- They are relevant to the context of length, disturbance, and long-term viability