Everglades Restoration

Incremental Analysis and Justification of a Comprehensive Plan

- Analytical and Policy Issues
- Lessons Learned
- Recommendations

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Why this is important...

• Ecosystem restoration and protection
  – Societal values
  – Abundant fish and wildlife; habitat
  – Clean water
  – Water supply and flood protection

• $,$$$,$$$,$$$.$00

• Authorization

• PIRs approved
  – Incremental justification
What we need...

- New paradigm for decision-making for watershed-scale restoration plans
  - Investment of taxpayers’ funds
- Prioritization and funding of individual projects based on sequencing logic
  - Availability of land
    - RE acquisition
  - Dependencies
  - Benefits to endangered species
  - Adaptive management
    - Scientific consensus
Comprehensive Everglades Restoration Plan

• 1999 Feasibility Report/Programmatic EIS
  • Conceptual level of detail
  • No cost effectiveness analysis of individual components (projects)
• 68 Components, combined into 56 projects
• Comprehensive plan approved by Congress as a “framework” via WRDA 2000
• WRDA 2000
  • Individual “Project Implementation Reports” required for project approval and authorization
  • Projects justified by environmental benefits to South Florida ecosystem
  • No further economic justification required, if project is cost-effective
  • Programmatic Regulations to be developed
CERP Components

- Aquifer Storage & Recovery
- Surface Water Storage Reservoir
- Stormwater Treatment Areas (STAs)
- Reuse Wastewater
- Seepage Management
- Removing Barriers to Sheetflow
- Operational Changes
Programmatic Regulations

- Final rule, November 2003
  - 6 detailed “Guidance Memoranda” to be developed

- Selected alternative plan must be “justified on a next-added increment basis”

- Next-added Increment defined:
  - “Next project to be added to a system of projects that includes only those approved and likely to be implemented”
  - New baseline condition
Additional Requirements (Guidance Memoranda)

- Pro Regs required six additional Guidance Memoranda
  1. Project Implementation Reports
  2. Formulation and Evaluation
  3. Savings Clause Requirements
  4. Identification of Water
  5. Operating Manuals
  6. Adaptive Management

- Initial Draft, February 2005; Final Draft July 2007
  - Concurrence required (not yet!)
GM 2: Plan Selection
“System Formulation”

- Alternative plans evaluated together with rest of CERP compared to FWO
- Acreage-based “Ecosystem restoration benefits” is metric
- Cost-effectiveness Analysis and Incremental Cost Analysis
  - Benefits compared to costs

Future Without Condition

No CERP

Future With Condition

Alternative 1

Alternative 2

Alternative 3
GM 2: Justification  
“Next-Added Increment Analysis”

Future Without Condition (2050)  
Authorized CERP Projects

Future With Condition  
Authorized CERP Projects  
Tentatively Selected Plan

What benefits would we get if nothing else in CERP was ever built?

• Project justification

• Ecosystem restoration benefits of Tentatively Selected Plan only

• Compared to a future baseline (includes only authorized CERP and non-CERP projects; not a likely future baseline)
Next-Added Incremental Justification Challenges

• CERP is a system of related projects (components)
  – Not incrementally formulated
• NAI is an evaluation of individual project’s effects over 16,000 sq. miles
• Comparison to a future baseline condition
  – Defined in Pro Regs and GMs
  – Better than current conditions
  – Unlikely (Exp Project, U.S. Sugar)
• Dependent on acceptable benefits quantification methodology
• Dependent on high-resolution modeling tools
• Results compared to costs to determine relative cost - effectiveness
  – Comparison between projects
Analytical Problems

• Regional hydrologic modeling (“system” approach)
  – Coarse grid size (averaging conditions within 4 sq. mile grid cells)
  – Modeling assumptions and operational rules

• Performance measures
  – Hydrologic outputs; not sophisticated enough to fully characterize ecological response
  – No acceptable performance measures for key indicators

• Ecological significance of hydrologic change
  – How meaningful is an average stage change of 0.05 ft.?

• Understanding spatial extent of ecological effects in a large system
  – Overlapping benefit areas
  – Attributes vary independently

• Ecological response time
  – Long time-scales for key ecosystem attributes
    • Average annual outputs; 50-year period of analysis
Justification Problems

- Components of comprehensive plan not incrementally evaluated
  - Restudy, 1997-1999: Base set of management measures optimized (Governor’s Commission Plan)
- Economic concept, not an ecosystem response concept
- Environmental benefits evaluation methodology
  - Inconsistent; no basis for comparison between projects
  - No programmatic tracking of environmental benefits
- No established threshold of acceptability
  - How much = justified?
  - Analytical and policy “do-loop”
- Comparing NAI benefits to system formulation benefits
  - Problematic; different baselines
  - Model results complicated by synergies
If not justified, what next?

- Consider combining the project with other CERP components or projects to identify a plan that can be justified; or

- Consider delaying implementation until other projects come on line that can improve the justification analysis.
Lessons Learned

• Incremental analysis of individual components of a comprehensive plan does not work well
  – Implementation of other watershed-scale restoration plans affected

• Real estate acquisition drives implementation sequencing
Recommendations

• Revise CERP Programmatic Regulations
  – 5-year review underway

• New implementation paradigm needed now!
  – Acquired/to be acquired land
  – Dependency logic
  – Incremental adaptive restoration principles
  – Benefits to endangered species!
    • Societal values
  – Adaptive management

• Integrated Delivery Schedule
  – Bigger than CERP
    • U. S. Sugar land acquisition
  – Update “Master Implementation Sequencing Plan”
Thank You!