Integrated Delivery Approach: Stream and Floodplain Restoration to Enhance Water Quality in a Eutrophic Basin in Central Florida

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Overview

- Water resource and watershed issues
- What is integrated delivery?
- Benefits of turnkey approach
- Integrated delivery case study

Water Resource and Watershed Issues

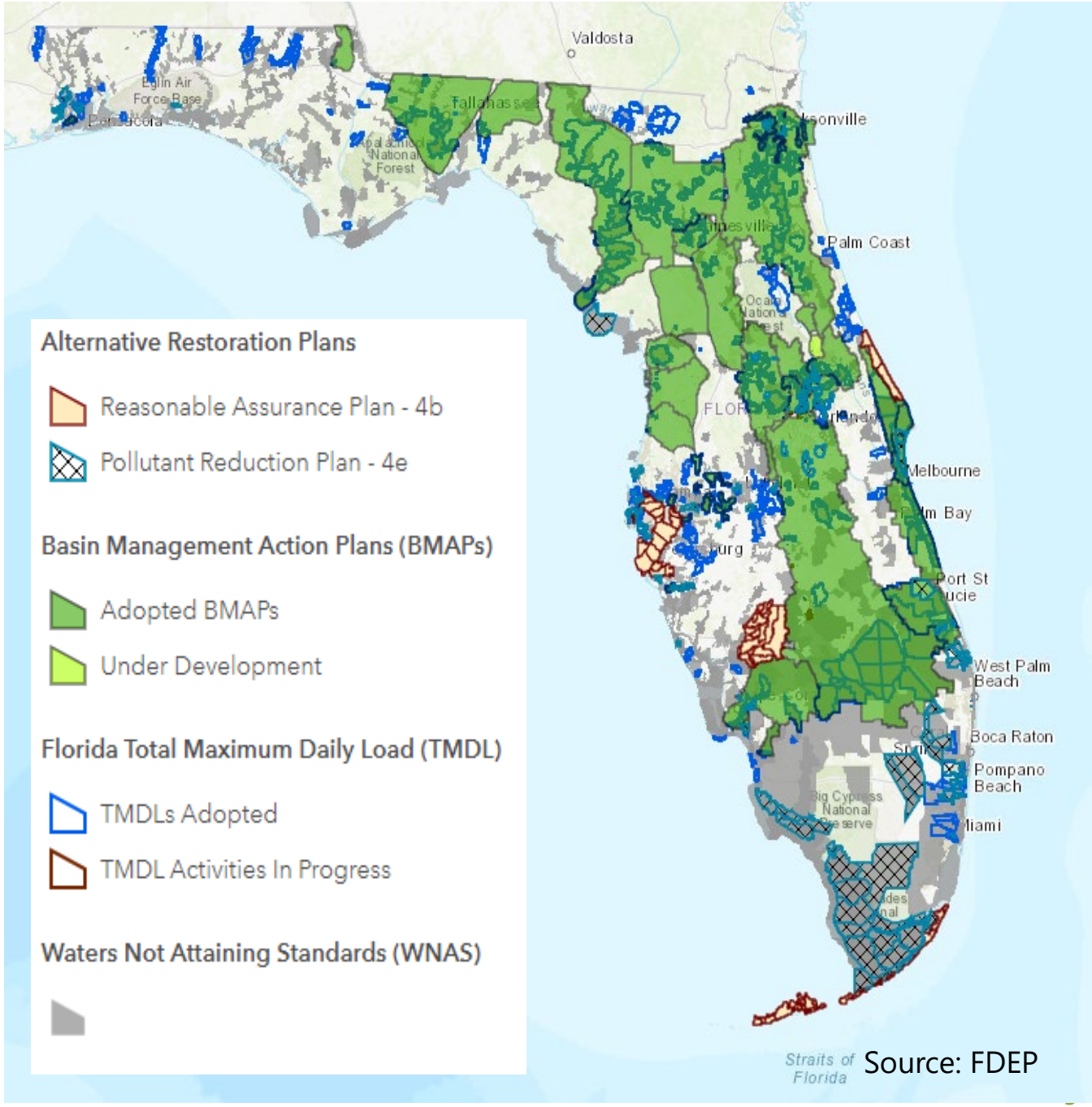
Impacts to Water Resources

Climatic and Anthropogenic Impacts

- Changes in precipitation, temperature, sea level rise
- Annual length of soil saturation, amount of organic matter, source of water
- Altered stream flows and loads due to erosion, sedimentation, and runoff
- Water chemistry changes – oxygen depletion, salinity gradients, turbidity, pollutants
- Loss of uplands, wetlands, streams natural buffers
- Fragmentation in connectivity
- Conversion of freshwater resources to tidal
- Transitions in species composition
- **Loss of resiliency**

Competing Issues

- **Water Quality**
  - **Nutrients**
  - **Bacteria/Pathogens**
  - **Heavy Metals**
- Water storage/flooding resiliency
  - MFLs
  - FEMA floodways
- Aquifer Recharge
  - Source
  - Quality
  - Location (recharge/discharge)



Source: FDEP

Current Challenges Facing Water Managers

Limited locations for large-scale/regional stormwater infrastructure

- When implemented on regional scale… do they work and are they providing enough value?

Can we address water quality and quantity with the same project? Are we missing opportunities?

- Or are these competing issues?
- Water quality criteria, minimum flows and levels (rivers, lakes, wetlands)

Are public parcels the optimal locations for stormwater infrastructure or restoration/resilience projects?

What role can privately owned properties and the private sector play in meeting goals for resilience, restoration and effective regional stormwater management?

Are there strategies to accelerate the implementation of nature-based solutions and green infrastructure or does it all fall to water managers to site, design, bid, and oversee construction and maintenance to ensure success?

Benefits of Integrated Delivery Approach

Alternative Delivery: Full Delivery or Turnkey

Turn-up Success through Turnkey

- **Water Quality & Ecological Restoration**
  - Nationwide issues
    - Growth, failing infrastructure, legacy
  - Standard solutions
    - Time to complete
    - Limited public parcels
  - Slow progress

- **Alternative Delivery - Turnkey Solutions**
  - Solutions and improvements implemented faster
  - Reduce risk to communities
    - Transfers risk and proof of performance to the provider
    - Reduces long term costs

*P3s expedite delivery of turnkey solutions

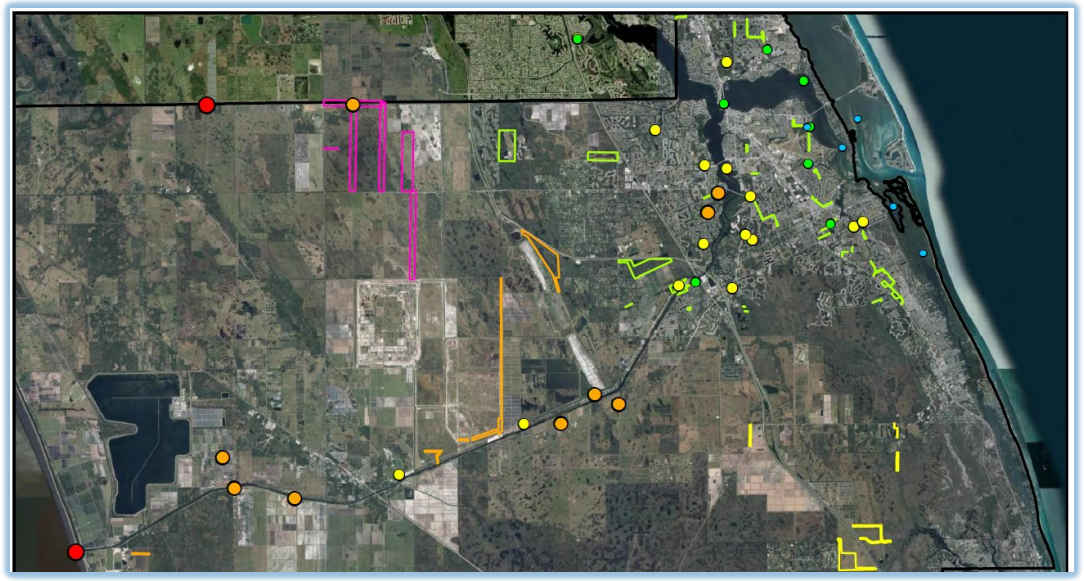
What is Alternative Project Delivery?

- Streamlining the total project timeline and cost by integrating the design, construction, and maintenance team from the beginning to the end of a project.
  - Begin value-engineering from Day 1
- Traditional Project Delivery Methods:
  - Design-Build
  - Design-Bid-Build
  - Construction Management-at-Risk (CMAR) (sometimes viewed as “Alternative Delivery”)
- Alternate Project Delivery Methods:
  - Pay-for-Performance
  - Pay-for-Success
  - Outcomes-Based Contracting

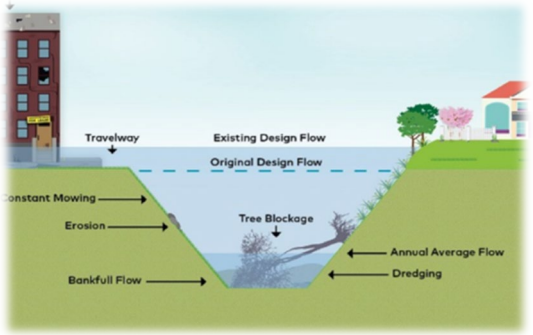
  (all one and the same)

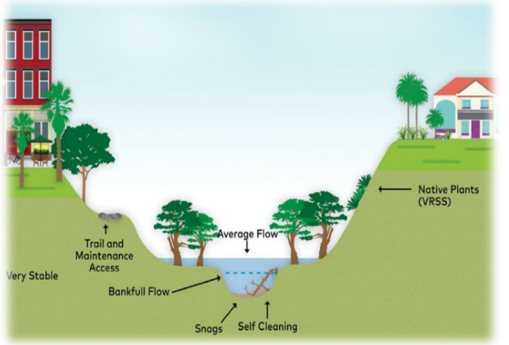
How Turnkey Approach Can Address Challenges

- Science driven restoration siting efforts focused on the most optimal location
- Parcels typically proposed for restoration are on public lands, which may not be optimal… so better to look at privately owned parcels to achieve goals
- Alternative delivery can address issues such as:
  - Flooding, water supply (saltwater intrusion, overdrawn aquifers) and ecosystem services (degraded water quality and habitat loss)
  - With solutions that include stream, lake, floodplain, wetland, restoration/enhancement; beneficial recharge of aquifers; attenuation of flows; reconnection of wetlands to surface waters and uplands, conservation, etc.



Public Lands As a Limiting Factor

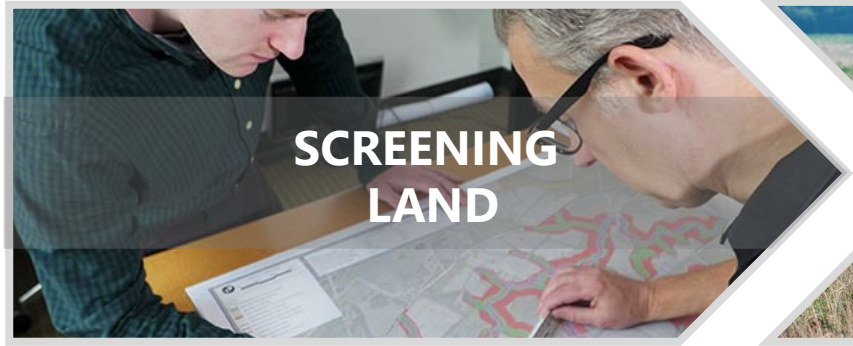




Turnkey Value (3R's)

_R_ight Place, _R_ight Time, _R_ight Resources = Best Project Performance and Value

Capital Availability + Technical Expertise + Access to Optimal Real Estate = Expedited Projects in Optimal Locations



- Assess for suitable property
- Determine technical and financial criteria to provide cost effective, high performing project with shortest implementation period

- Financial flexibility in land purchases allow government entities greater access to lands
- Unique Teaming Strategies allow the Private entity to transact land that may otherwise be unavailable to government.

- Long-term monitoring and stewardship
- Predictive ability to understand and plan for costs early in the design process

Design Permit Construct

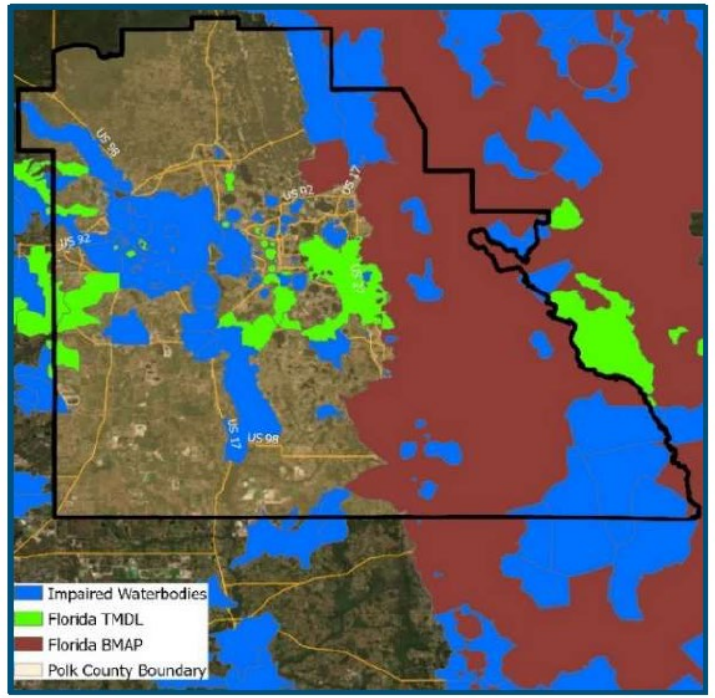
Integrated Delivery Case Study

Project Impetus

- Polk County one of fastest growing regions in Florida and in the nation (>1500 people/d)
- Over 80 impaired waterbodies with over 40 TMDLs in the County
- Rapid growth, development, and land use changes weighing heavily on region's natural resources, particularly surface water and groundwater
- Region included in Water Resource Caution Area for water supply
- Minimum Flow and Level (MFL) set for Peace River

Table: Total Impairments and TMDL Documents for Watersheds in Polk County.

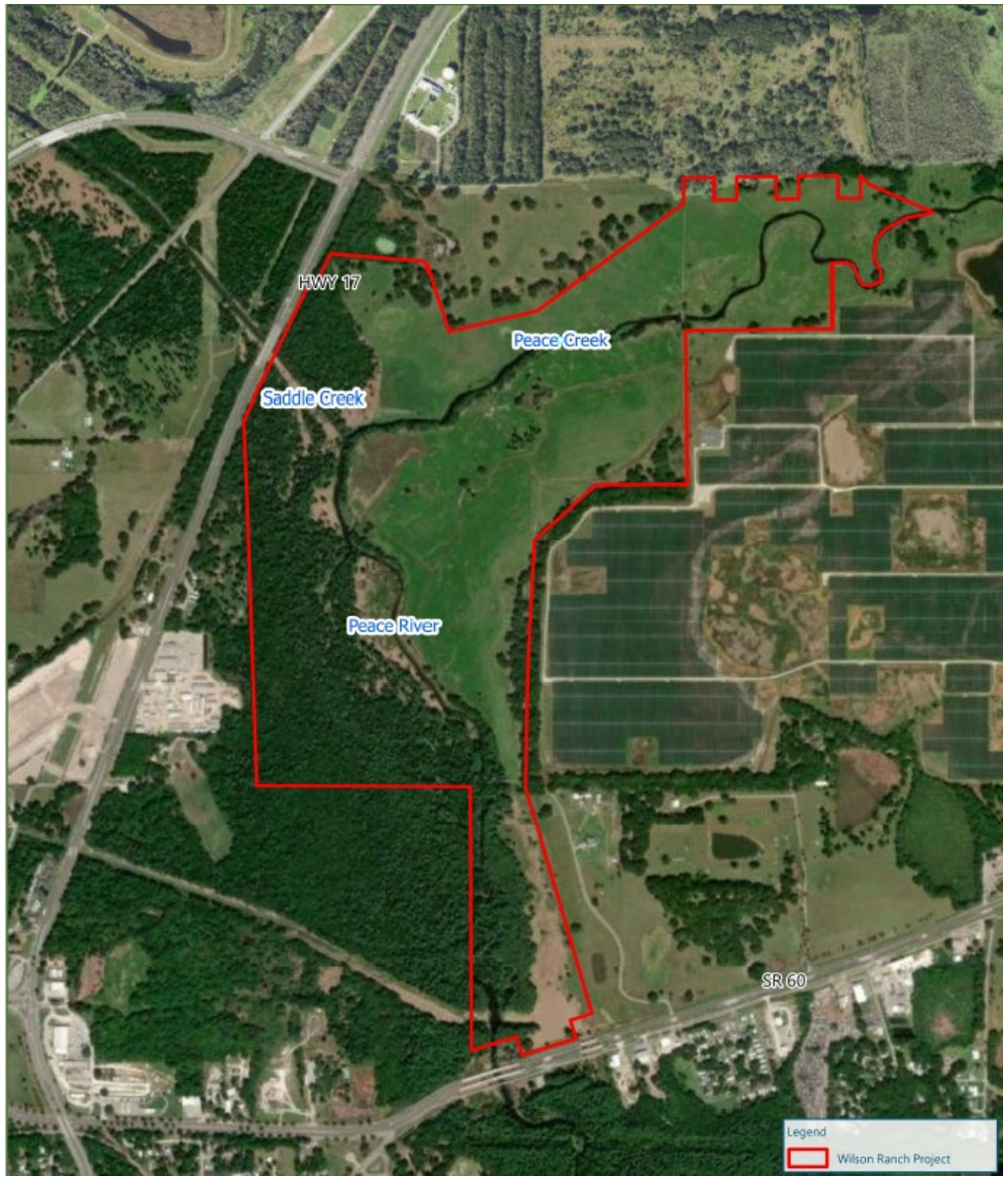
	DEP Impaired Waterbodies	DEP Impaired Lakes	DEP Impaired Rivers	EPA Impaired Waterbodies	WBIDs with TMDL Documents
Alafia River	5	1	4	-	3
Hillsborough River	9	3	6	2	3
Kissimmee River	22	10	12	3	11
Upper Ocklawaha	4	-	4	-	-
Peace River	54	41	13	-	24
Withlacoochee River	3	1	2	18	2
Total	**81**	**54**	**28**	**23**	**41**



FDEP Polk County Regulatory Map

Full Delivery Outcome – Wilson Ranch REServe

- East of Tampa, FL in Lakeland, FL
- Hydrologic / water quality restoration through a P3 turnkey project including restoration / enhancement of floodplain, stream, and wetlands on approx. 400 ac of previously drained cattle ranch / improved pasture lands
- Nearly 9,000 linear feet (LF) of stream restoration of Peace Creek and the headwaters of the Peace River will be performed in addition to restoring and enhancing approximately 360 acres of wetland
- Improve water quality, resiliency and sustainability in the tribs, the river, the downstream receiving Charlotte Harbor Estuary and the region
- Increase water supply and recharge opportunities, and enhance and preserve the natural system

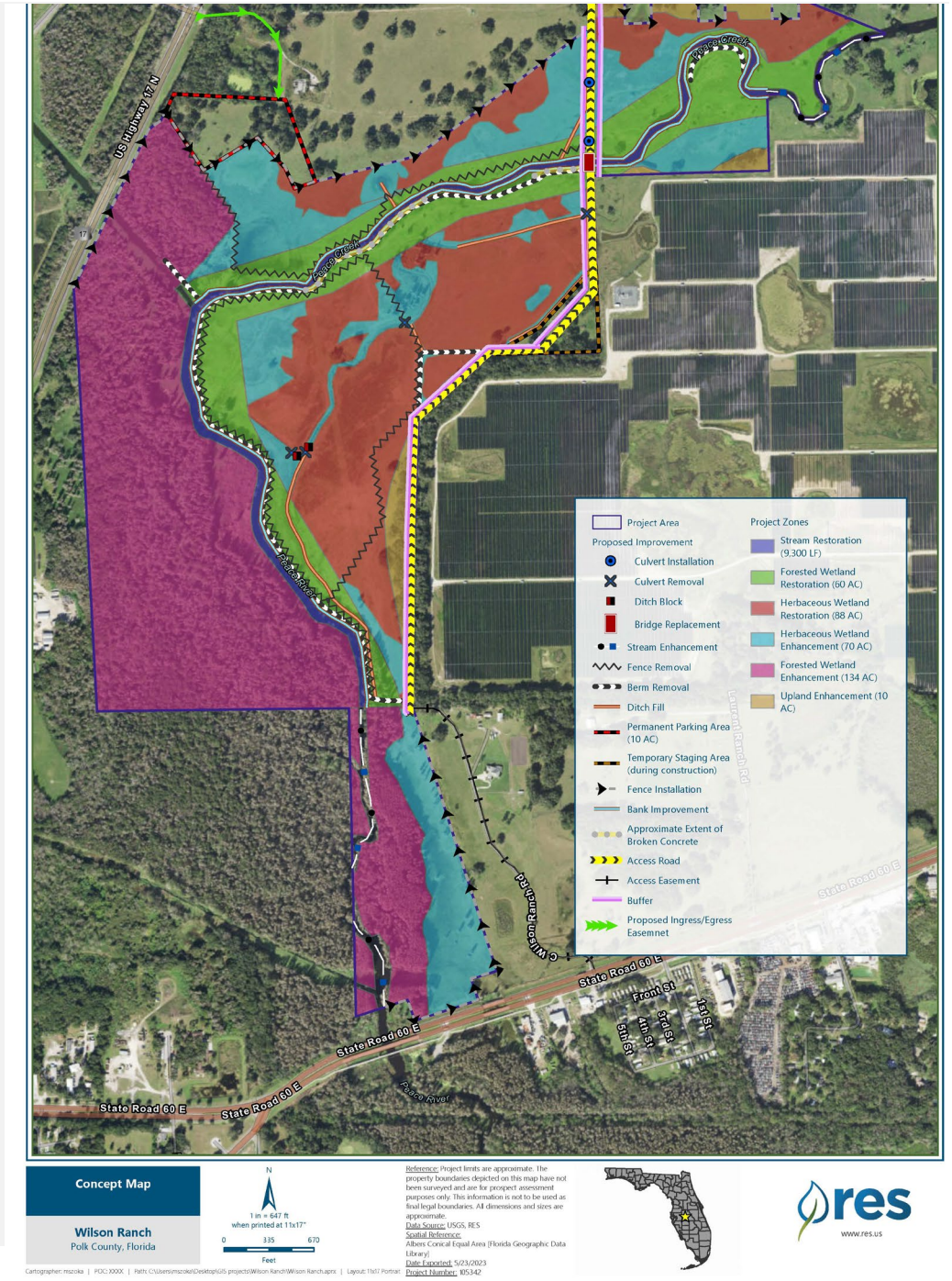


Stream Pre-Restoration Conditions

- Area heavily altered to facilitate agricultural practices
- Classified as low gradient sand bed system with wide, shallow channels that should be frequently connected to overbank flow (flatwoods alluvial floodscapes, FIPR 2015)
- Stream channel historically straightened and widened and most wood removed, with reduced habitat and 10 ft high berms severing connection to floodplain
- Dominated by invasive non-native vegetation

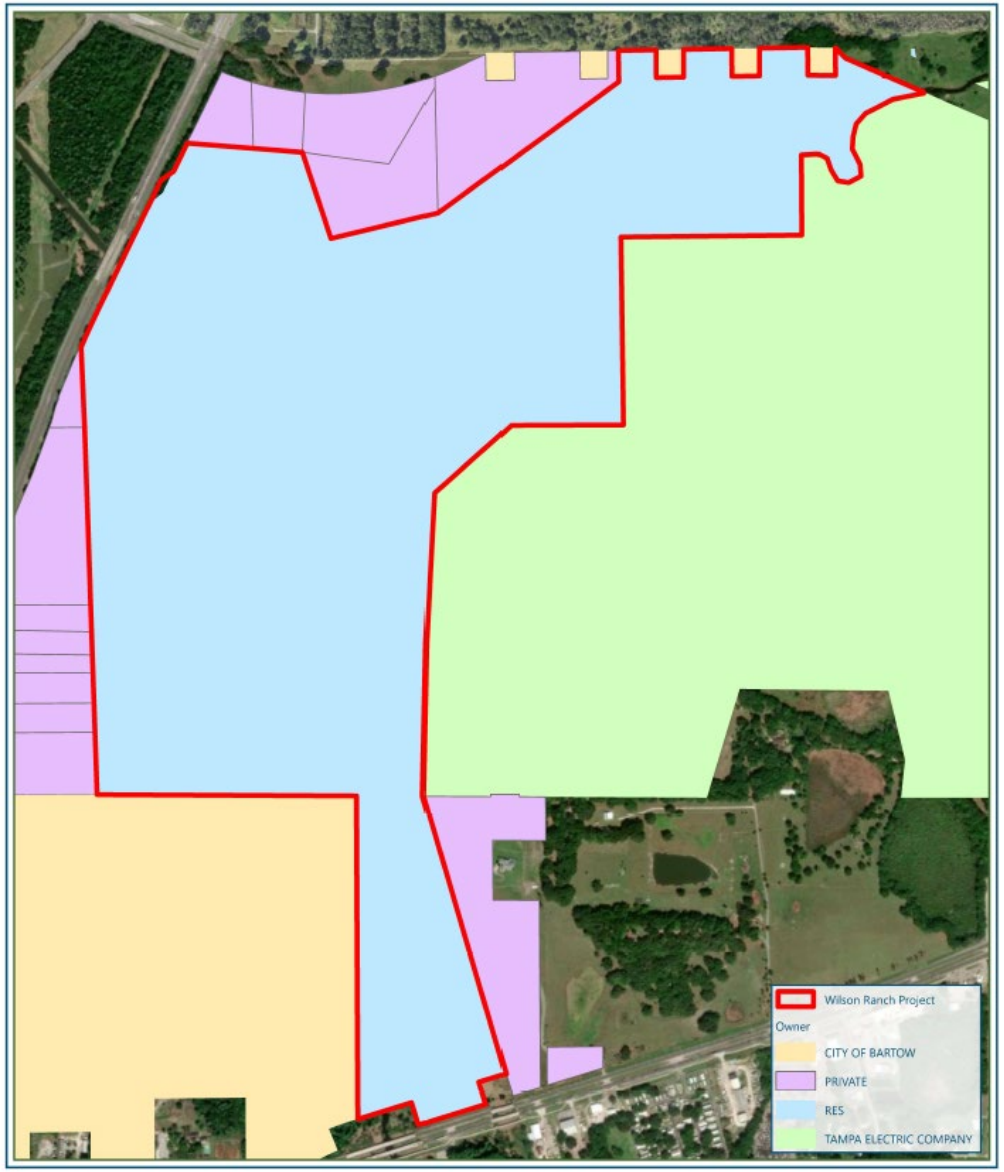
Stream Restoration - Concept

- Stream restoration on both banks of 5,600 LF of Peace Creek
- Stream restoration on one bank of 3,600 LF of Peace River
- Restoration of channel will follow natural channel design using local reference reaches and regional data, addressing site specific geomorphic and ecological functional deficits
- Will repurpose on-site materials
- Restoration includes:
  - Construction of bank full benches
  - Placement of large woody debris
  - Construction of approximately two large riffles
  - Floodplain wetland recreation



Turnkey Outcome Phasing

- Project Phases
  - Land Acquisition
  - Desktop Analysis
  - Conceptual Design
  - Funding Strategy Development
  - Transfer of Risk
  - Design & Permitting
  - Construction
  - Operations & Monitoring
    - Operations – 25 years
    - Monitoring – First 10 years
      - Water quality, hydrology, BEHI, macroinvertebrate diversity
  - Transfer Project to County in 2048



Integrated Delivery Process through Public-private Partnership (P3)

1. Meet with Polk County to identify County's priorities
2. Discuss water quality and resilience goals for impaired waterbodies
3. Collaborate to identify available restoration opportunities with public and/or private land acquisition
4. RES acquire 400+ acres of private ranch lands in headwaters of Peace River in Central FL
5. Develop conceptual approaches and expectations for pay-for-performance benefits from full delivery outcome
6. Discuss key design elements and constraints
7. Submit unsolicited proposal under **P3 Fla. Stat. 265.065(3)**
8. County review proposal and publicly notices that proposal received, and others may be evaluated
9. County negotiates and develops comprehensive agreement with pay-for-performance metrics mutually defined
10. RES implements P3 turnkey delivery outcome in a cost-effective and expedited manner

Pay-for-Performance Benefits:
-Reduce pollutant loads from watershed and direct channel erosion (N, P, TSS)
-Restore wetlands and streams
-Enhance aquatic habitats and macroinvertebrate species diversity
-Flood volume retention/control

FL Legislature recognized:

- *Public resources are inadequate to meet capital and operational needs*
- *P3s can meet public "needs by improving the schedule for delivery, lowering the cost, and providing other benefits to the public".*

Thank you

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