



Relevance of Ecosystem Services and Ecological Resilience in Managing Corporate Lands

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Land and Business

- Land is physically linked to all aspects of your business
 - Resource acquisition
 - Manufacturing sites
 - Product storage and distribution
- Functions to support operations
 - Buffer - Safe and secure operations
 - Green Infrastructure - Stormwater



Ecology vs. Engineering

“What is Engineering? The Control of nature by man. Its motto is the primal one – ‘Replenish the earth and subdue it Is there a barren desert – irrigate it; is there a mountain barrier – pierce it; is there a rushing torrent – harness it. Bridge the rivers; sail the seas; apply force by which all things fall , so that it shall lift things. Appropriate, annex, absorb, the powers of physical nature into human nature”

Rossiter W. Raymond 1913 (from A.H Wurth, Jr, 1996)

- Environmental protection = Engineering strategies
 - *Compliance* at fence line, at the stack, at the outfall
 - Going beyond compliance driven by efficiency and cost reduction
-

Changing Corporate Behavior

- Exploring the relevance of ESS since MEA 2005
- Shifting from a focus on avoiding impacts to environment to integrating nature into their Business
- Natural Infrastructure; ecological remediation and redevelopment strategies/ and marketable ecosystem services are becoming routine considerations
- As corporations choose nature-based solutions over traditional engineering the more ecosystem service flow and ecological resilience become design considerations

Why the Change ?

- Triple bottom-line performance
- Corporation
 - Less capital required
 - Lower operating costs
 - Managed risk / Limit liability
 - Generate revenue
- Community
 - Provide ecosystem services
 - Reduce risk to community
- Regional Ecology
 - Conserve natural capital
 - Support conservation goals

Business Case is Clear !!

Operations

Conservation stewardship activities can support a safer, compliant operating environment.

- 01 BIODIVERSITY IMPACTS
- 02 REMEDIATION REMEDIES
- 03 PERMIT ACQUISITION AND RENEWAL
- 04 SOCIAL LICENSE TO OPERATE
- 05 RISK MANAGEMENT AND REDUCTION

Corporate Citizenship

Nature-based programs and conservation efforts can benefit a variety of corporate citizenship targets.

- 06 COMMUNITY ENGAGEMENT
- 07 INVESTMENT IN EDUCATION
- 08 TALENT ACQUISITION
- 09 SUSTAINABILITY GOALS AND PERFORMANCE
- 10 REPORTING AND DISCLOSURES
- 11 SRI AND SHAREHOLDERS

Business Management

Conservation can contribute to business management targets with positive bottom line outcomes.

- 12 EMPLOYEE ENGAGEMENT
- 13 BUSINESS UNIT INTERACTION
- 14 LANDS MANAGEMENT
- 15 NATURE-BASED SOLUTIONS
- 16 GOVERNMENT RELATIONS

Wildlife Habitat Council "C-Suite 16"

Corporate Focus on Value of Nature

- Ecosystem Services
 - Broadens perspective on value of nature to business
 - Highlights connections beyond fence
 - Community
 - Landscapes
- Ecological Resilience
 - Protection of investment
 - Compliance assurance
 - Risk management



Regional Context of Land Value

- Not just *Fair Market Value*
- Doesn't end at the property lines
- Linked to physical and functional regional systems
- Understanding regional linkages is the key to identifying Conservation opportunities

Total Economic Value

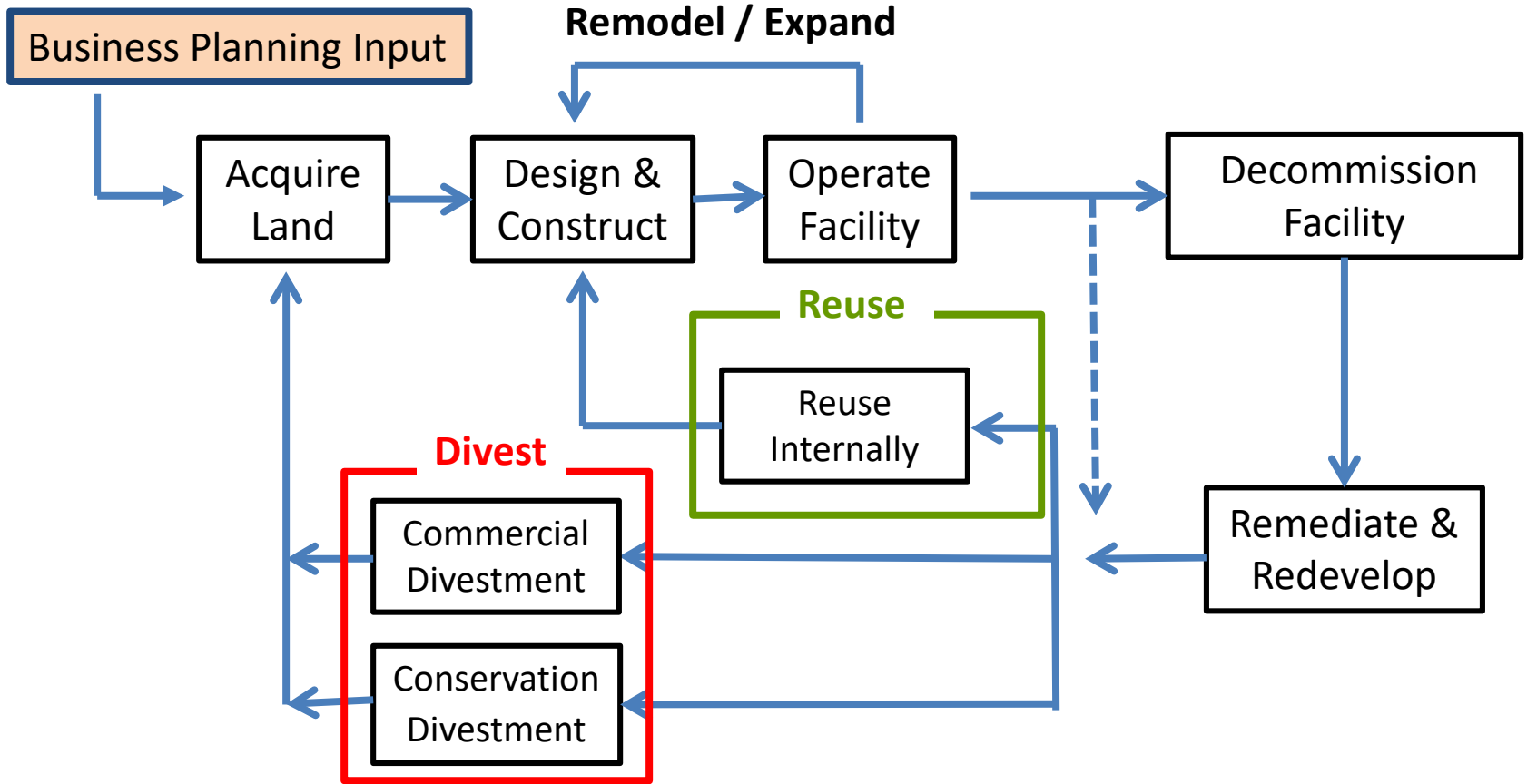


Natural Land Management Strategies

- Integrating nature into design
- Natural landscaping
- Voluntary conservation
- Manage for wildlife /lower taxes
- Greening remediation
- Tapping *Ecosystem Markets*
- Mixed-use redevelopment
- Conservation divestment



Property Ownership Life Cycle



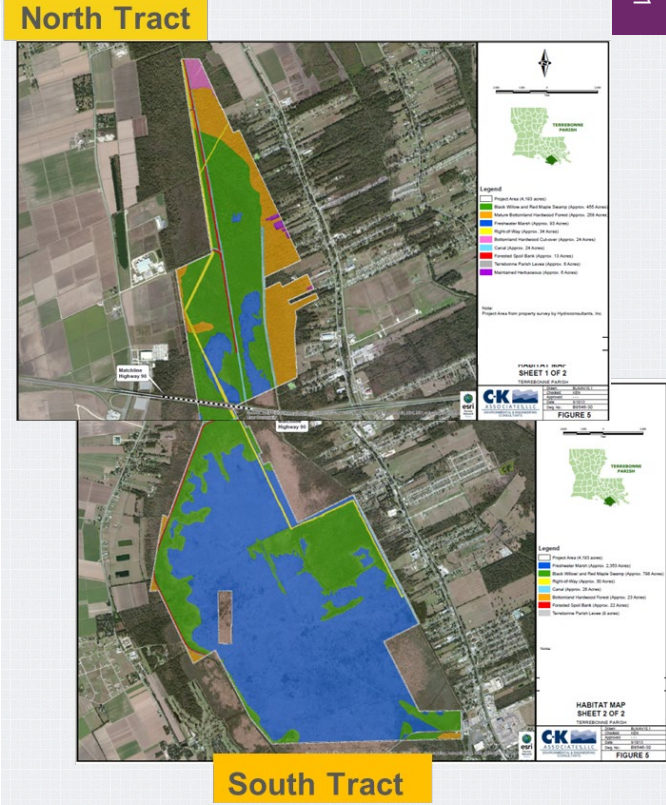
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Context Informs the Path to Conservation

- O&G exploration
- Active development
- Degraded hydrology
- Local flood control
- Divestment strategy ?
 - *Hunt Club*
 - Limited commercial
- Restoring hydrological flux will add value
 - Greater detention
 - Wetland mitigation
 - Remove stress ; allow recovery

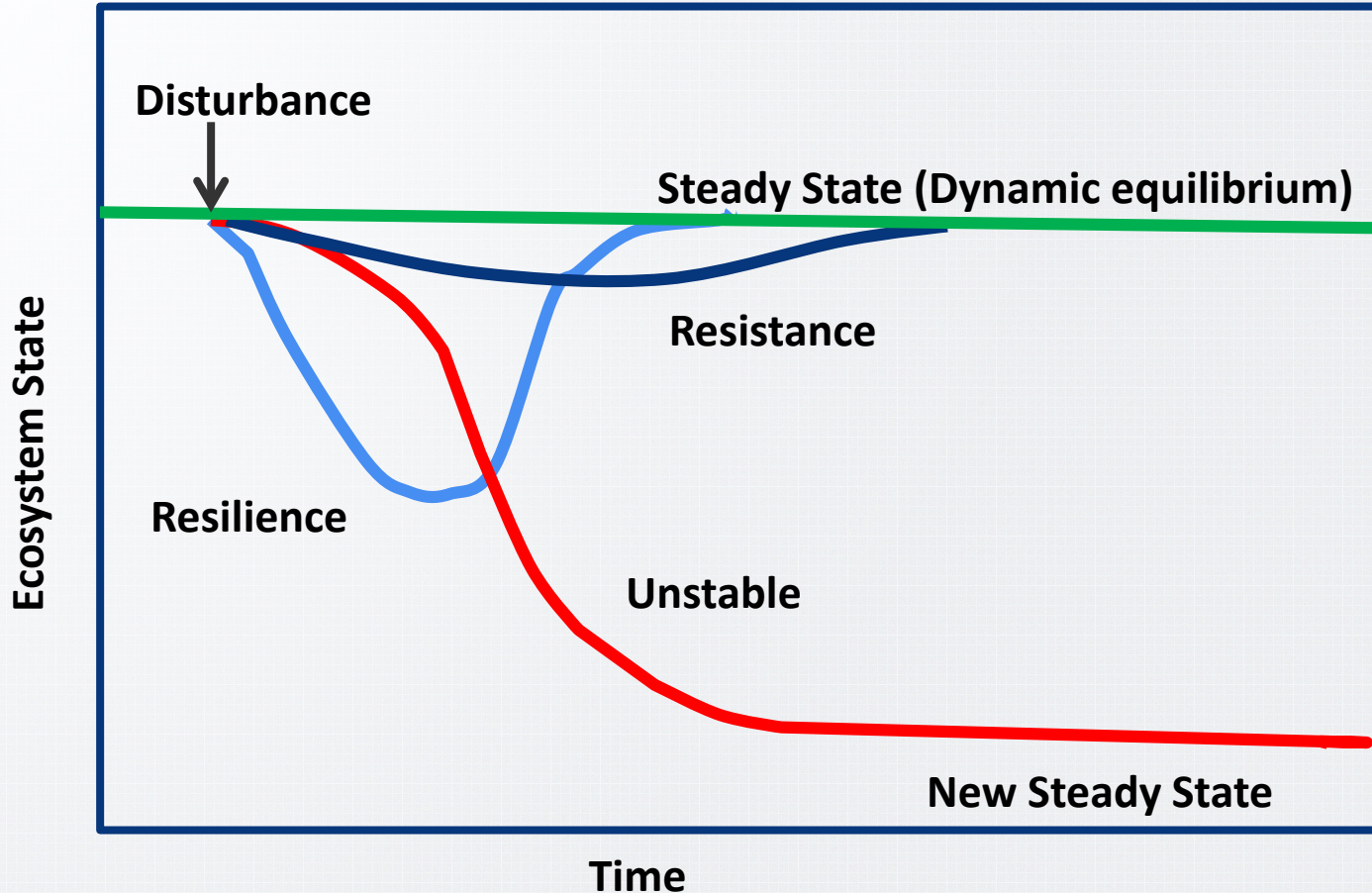


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Ecosystem Response to Disturbance



Louisiana's Sinking Coast Is a \$100 Billion Nightmare for Big Oil

The state can't pay, so someone has to. And the water keeps rising.

August 17, 2016 – www.Bloomberg.com/news

- Subsidence, sea level rise and lack of sediment input creating risk
- Facilities (e.g. pipelines) exposed to collisions and extreme weather
- Risk of equipment damage and spills
- Access to resources lost as they sink

Coastal Louisiana provides a useful microcosm to explore

- Business drivers
- Project examples

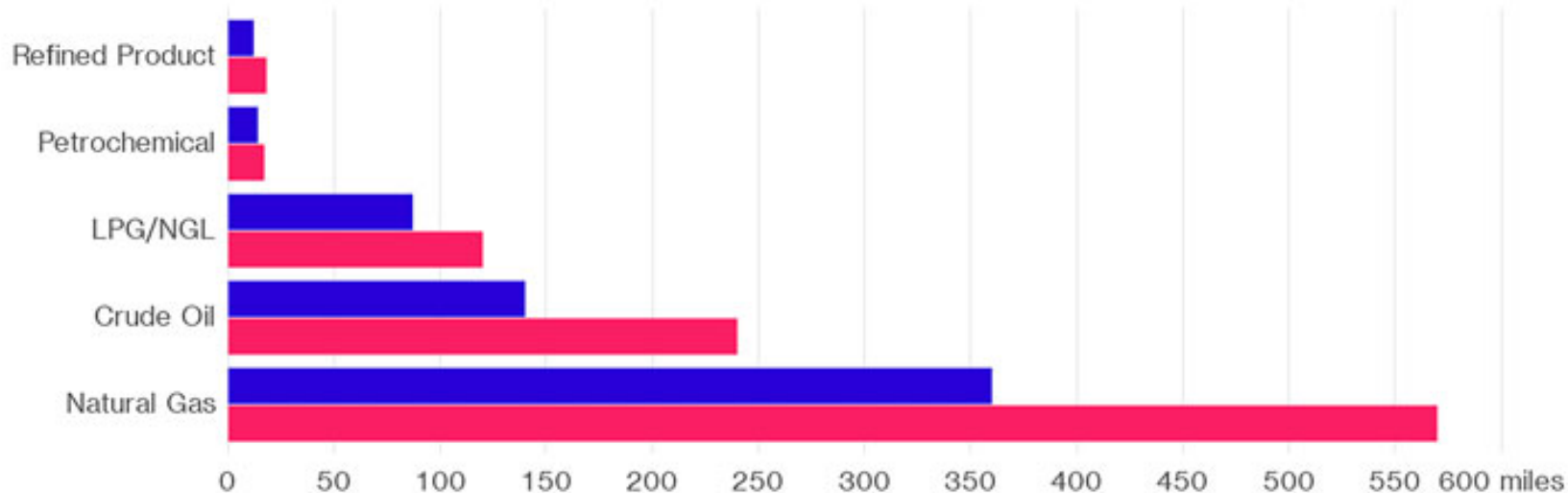


Members of the Louisiana Coastal Protection and Restoration Authority walk over pipeline on the beach at Port Fourchon, site of the Caminada Headland Beach and Dune Restoration project.
Photograph: William Witow/Betta

Louisiana Pipelines at Risk From Coastal Erosion

More than 600 miles of pipeline in the state could be exposed to open water in the next 25 years.

■ 25-year estimate ■ 50-year estimate



Source: Louisiana State University and Rand Corporation study, based on infrastructure inventory and valuation data from the LSU Center for Energy Studies.

Bloomberg 

August 17, 2016 – www.Bloomberg.com/news

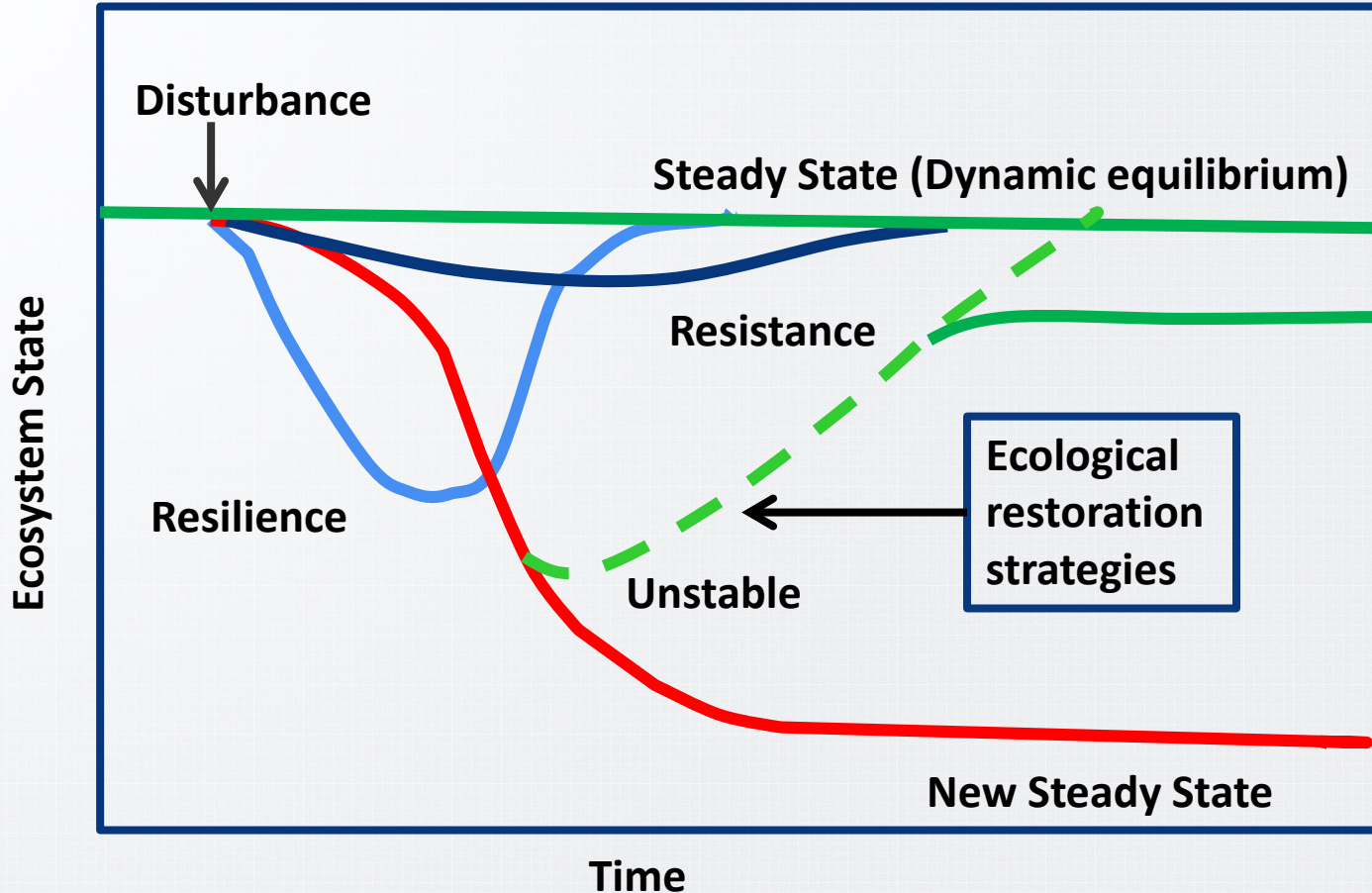
Conoco and Ducks Unlimited Partnership

- **Loss of Coastal Marsh threatens**
 - habitat for ducks
 - O&G Infrastructure
 - Parish hurricane levy
- Installing **vegetated terraces** in shallow open waters **cost-effective** restoration and **protection strategy**
- Terraces **decrease wind and wave energy**
- Goal was to **demonstrate technology**



Bayou L'Ours – Lafourche Parrish , LA

Restoration to Restore Stability

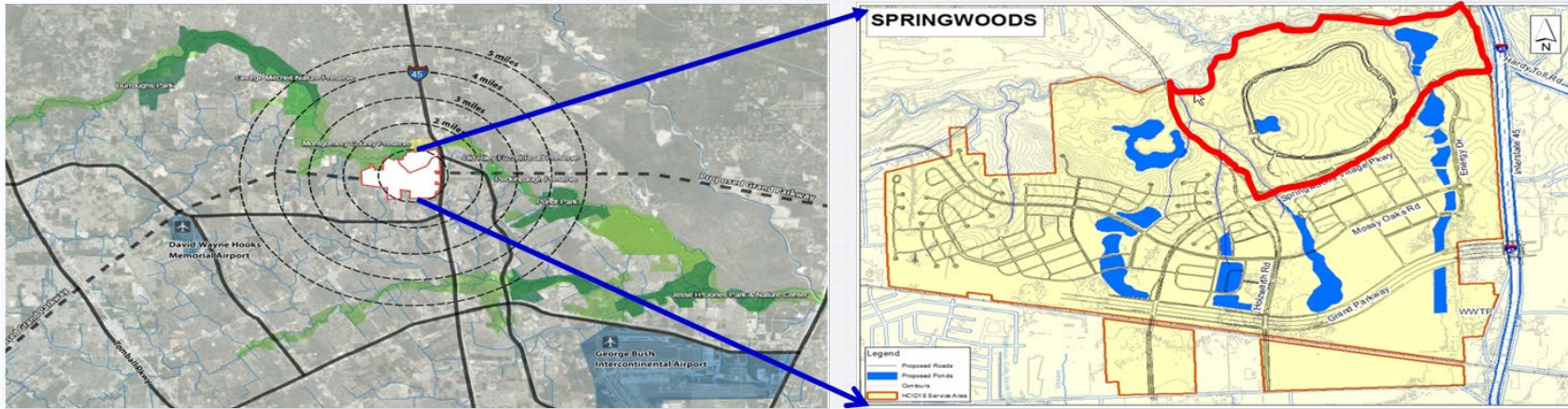


Conservation Land Management Strategies

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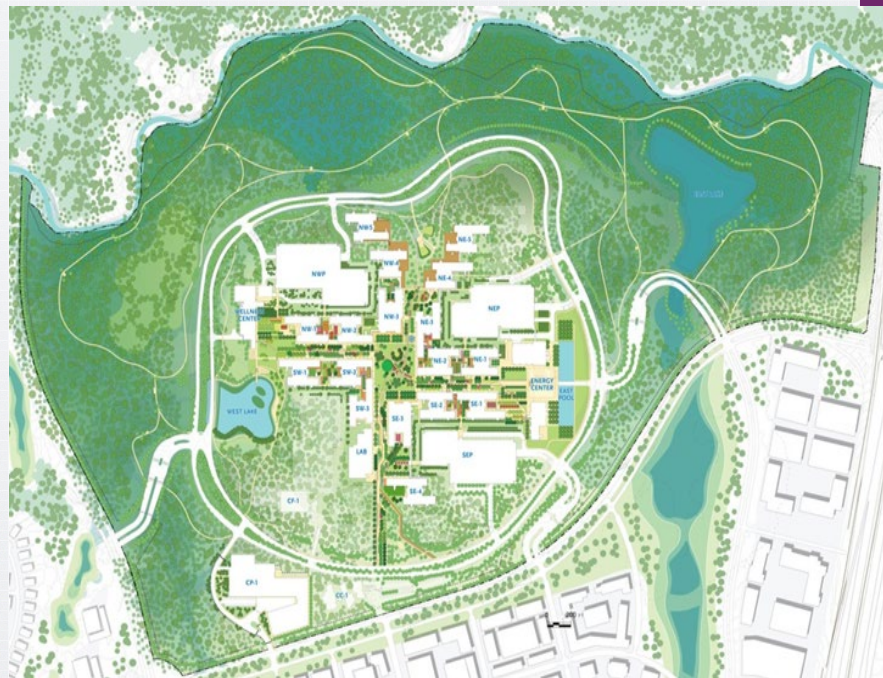
Campus Design – Linked to Nature



- Property connected to natural water systems and evolving “creek” greenway; connected to new sustainable community
- Former Uses - working oil field (13 well); Timber and hunting leases
- Design Integrates *Natural Land Management*, *U.S. GBC LEEDs* and *Sustainable Sites Initiative*

Integrated Design with Ecosystem Services

- Limited physical footprint - < 50%
- Floodplain buffers retained
- Extensive trail system provides access to nature
- Natural stormwater infrastructure
- Aggressive rainwater harvesting
- Lakes served as habitat and as non-potable storage
- Campus 80% Non-potable
- Wastewater recycle in future

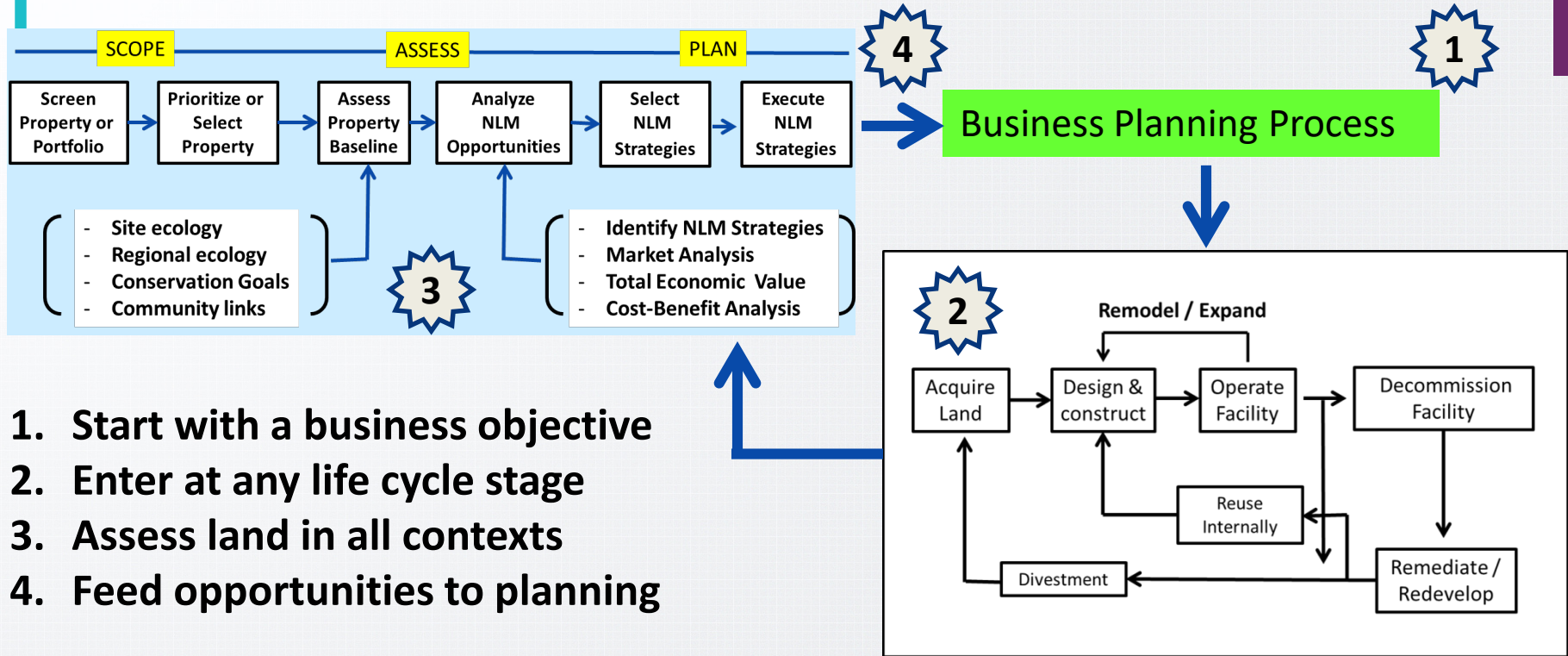


Low Impact Design (LID)

The Path to Success

- Make *Natural Capital* of land a core business consideration
- Build capacity to capture *Total Economic Value (TEV)* of land
- Recognize as much of TEV in *Net Present Value* calculations
- Recognize TEV / NPV of land as input to traditional planning processes
 - Annual plan
 - Capital Project design
- Apply strategies over life cycle ; Start at beginning to maximize value

Strategic Implementation Process



1. Start with a business objective
2. Enter at any life cycle stage
3. Assess land in all contexts
4. Feed opportunities to planning

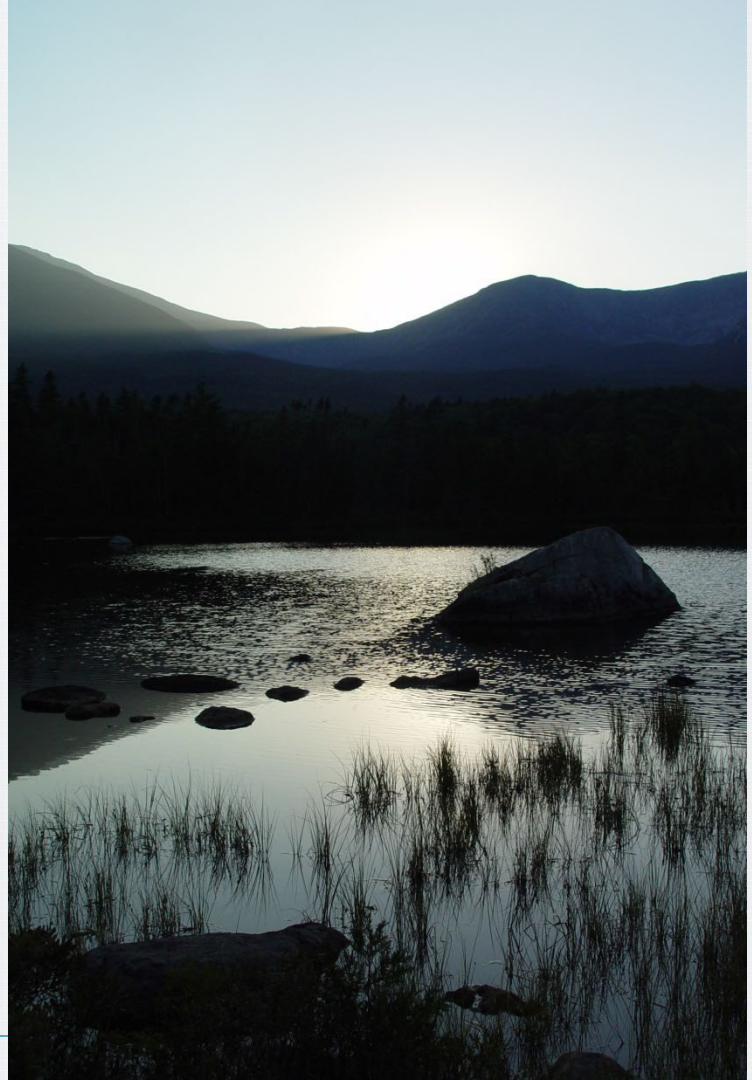
Maximum value obtained by application throughout life cycle

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Questions ? Comments ?

Every Act of Conservation Matters