Northwest Florida Water Management District

Escambia County RESTORE Advisory Committee

Habitat Improvement Presentation

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Reference Bible:

Ecological Restoration

for Protected Areas

Principles, Guidelines and Best Practices

International Union for Conservation of Nature (IUCN)
World Commission on Protected Areas (WCPA)
Ecological Restoration Taskforce

Habitat Improvement Presentation

What is Advisory Committee's Habitat Improvement or Restoration Mission or Goal?

Society for Ecological Restoration (SER)

Mission: *"To promote ecological restoration as a means of sustaining the diversity of life on Earth and re-establishing an ecologically healthy relationship between nature and culture."*

Habitat Improvement or Ecological Restoration for Protected Areas

Principles, Guidelines and Best Practices

- Reference: offers a **guidance framework** for ecological restoration that is intended to support managers of, and stakeholders in, protected areas of **all categories and all governance types** in their efforts to restore natural and associated values of protected areas.

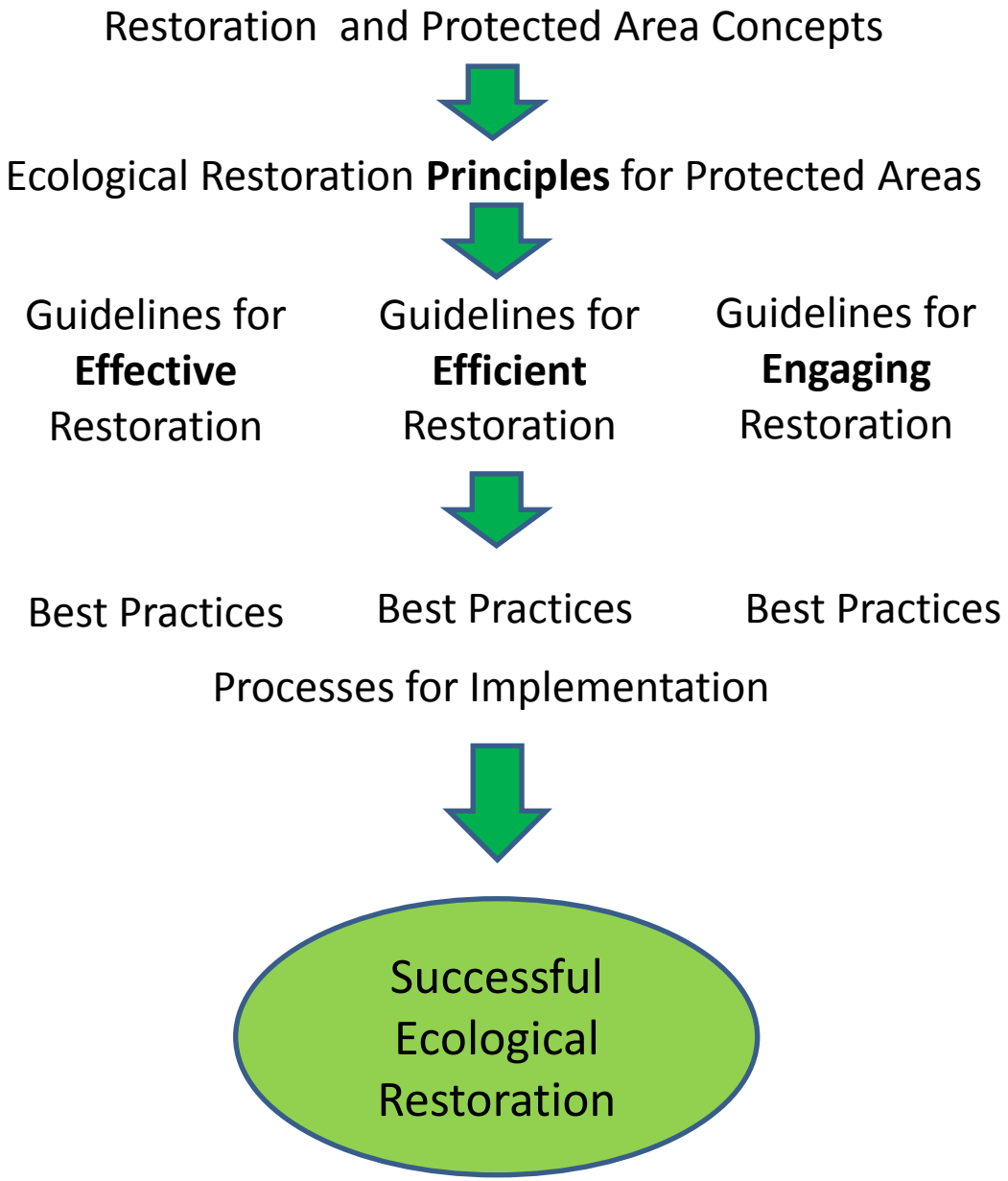
- As we increase our efforts to restore protected area values, however, we must also act with caution and humility, recognizing that **ecological restoration is a complex and challenging process and that our interventions can have unforeseen consequences.**

- This guidance framework thus has at its foundation a **clear set of principles** which, rather than defining rigid processes, underpin an approach that encourages a **holistic perspective, broad collaboration, careful planning, and thoughtful implementation** to achieve results.

What to think about in setting policies, goals and objectives

What to do in planning and executing projects and programs

Learn from case studies (others)



Restoration and Protected Area Concepts

Definitions

- **Ecological restoration:** 'the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed' (SER, 2004)

- **Protected area:** 'A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values' (Dudley, 2008)

Key Concepts

- Restoration in and around protected areas **contributes** to many **societal goals** and **objectives** associated with **biodiversity conservation** and **human well-being**

- Reasons for implementing restoration projects vary and may include, for example, **recovery of individual species, the strengthening of landscape or seascape-scale ecosystem function or connectivity, improvement of visitor experience opportunities, or the re-establishment or enhancement of various ecosystem services**

- Restoration can contribute to climate change adaptation by **strengthening resilience to change and providing ecosystem services.** It can contribute to climate change mitigation by **capturing carbon** in ecosystems

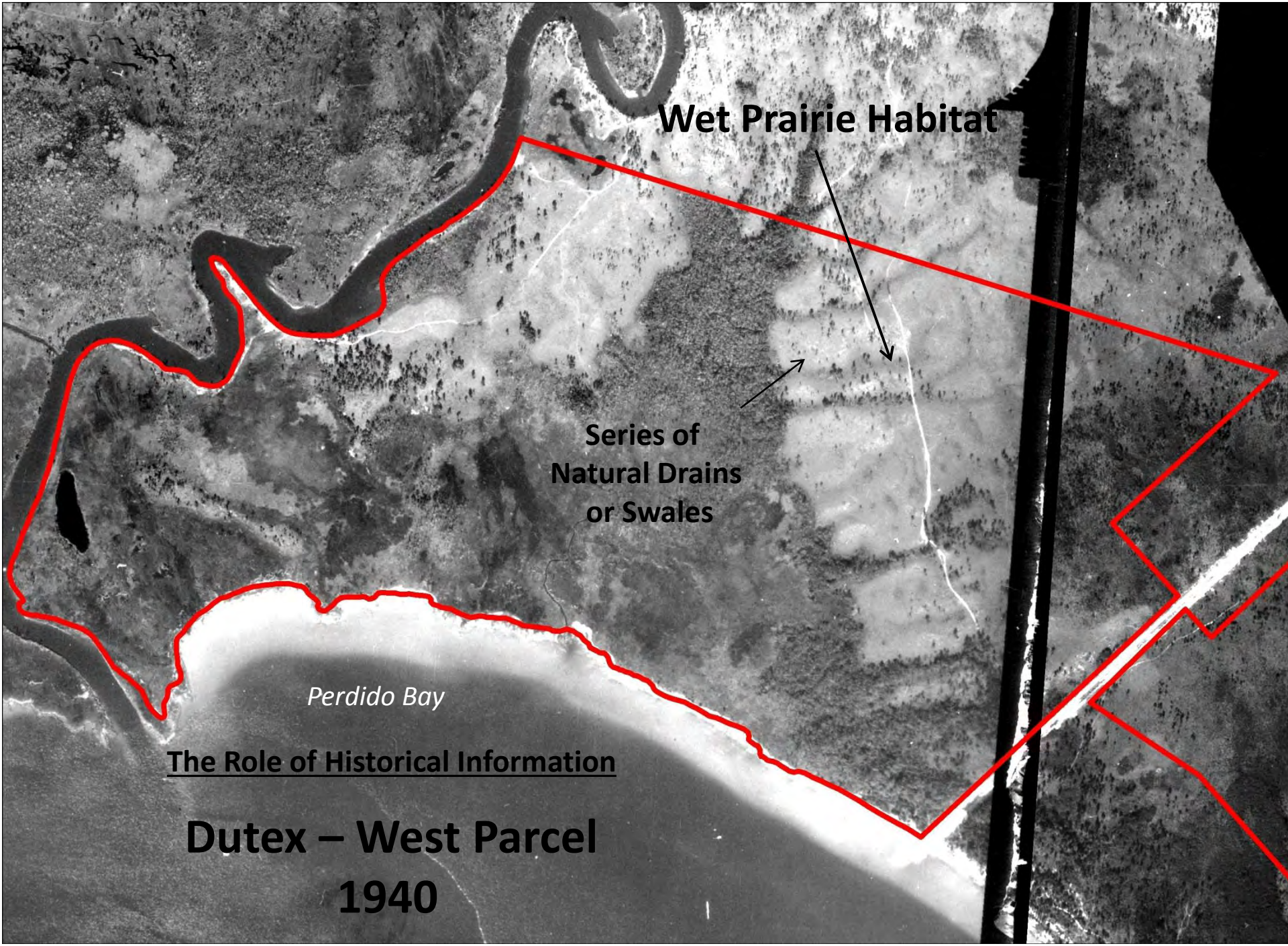
- Rapid climate change and other global changes create additional challenges for restoration and underscore the **need for adaptive management**

- Protected area managers need to **work with stakeholders and partners** inside and outside protected area boundaries **to ensure successful restoration** within and between protected areas


Key Concepts Represented?
Plentiful & Clean Water
Ecosystem Service
Species Diversity
Listed Species
Ecosystem Function
Visitor Experience
Climate Change
Adaptive Management
Stakeholders & Partners

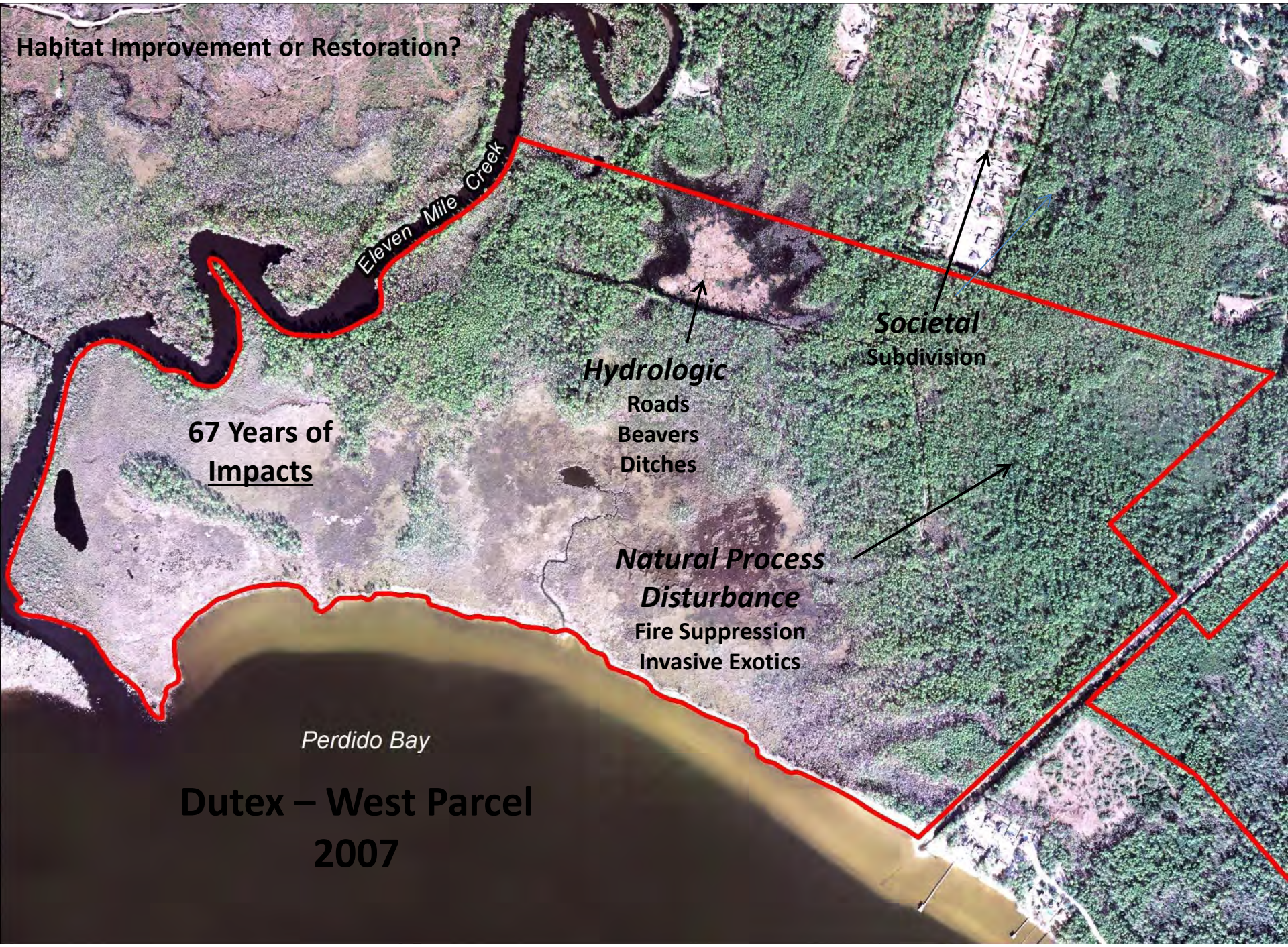
Reasons for Restoring Protected Areas

- To restore ecological integrity by **re-instating key ecological processes**
- To restore ecological integrity by **reducing the influence of invasive species**
- To restore ecological integrity by **maintaining or recovering species and habitat degraded or lost**
- To restore ecological integrity by **reintroducing species to former habitats**
- To restore ecological integrity by **re-establishing natural hydrology, or other physical and chemical conditions that support ecosystem structure and function**
- To **connect** existing protected areas, or habitat patches within a protected area
- To **enhance the resilience of ecosystems** and help nature and people adapt to climate change
- To **improve or provide high quality visitor experiences** of the protected area



The Role of Historical Information

Dutex – West Parcel
1940


Habitat Improvement or Restoration?
Eleven Mile Creek
Societal
Subdivision
Hydrologic
Roads
Beavers
Ditches
67 Years of
Impacts
Natural Process
Disturbance
Fire Suppression
Invasive Exotics
Perdido Bay
Dutex – West Parcel
2007


Hydrologic Restoration
Low Water Crossing


Beaver Management
Animal & Dam Removal


Dutex Tract
Restoration Activities
Pre-Burn


Post Burn

RESTORATION CONCEPTS

Uncertainty and Adaptive Management

Uncertainty

Adaptive Management

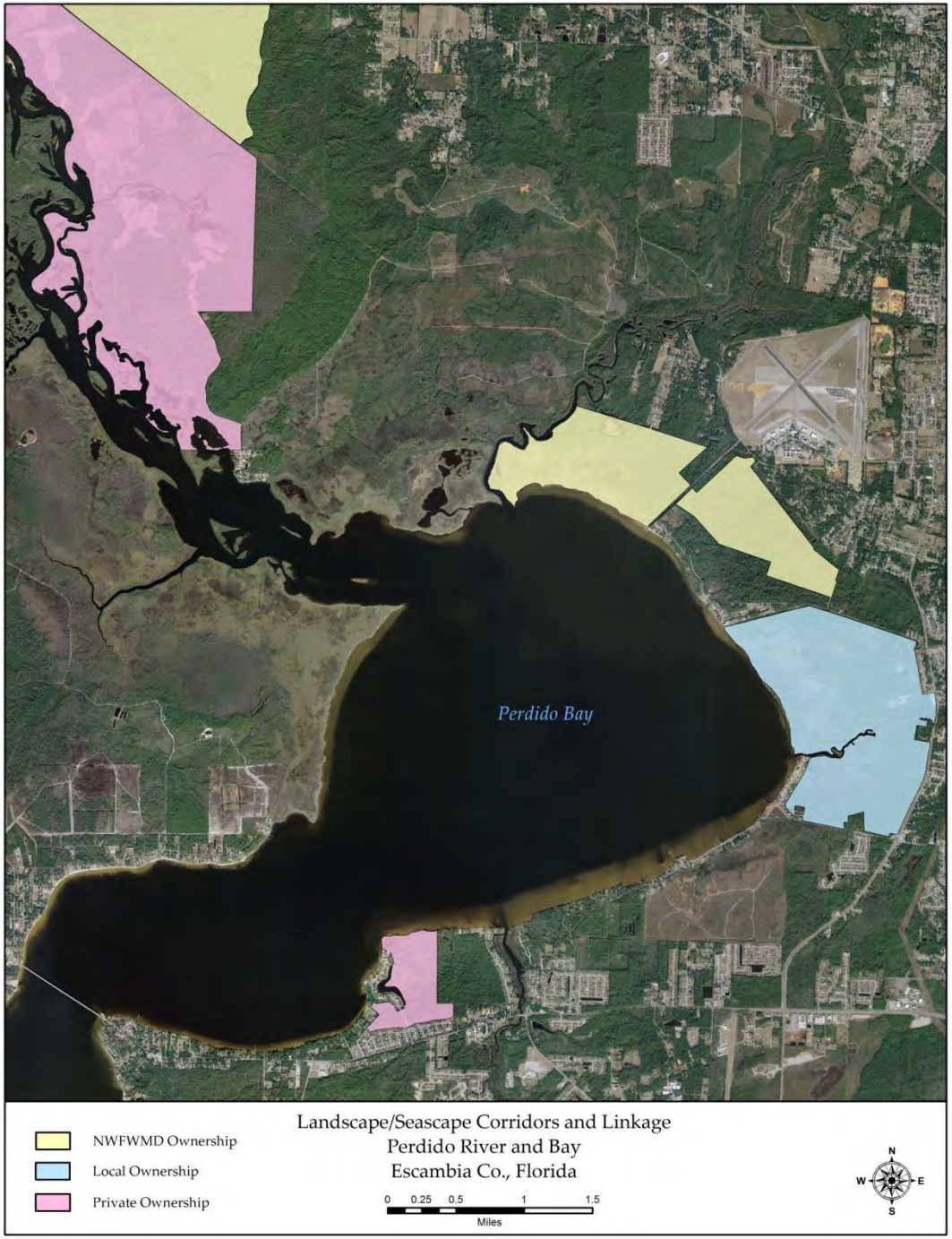
Hydric Pine Flatwoods Restoration
Gyro-Trac: March – July 2007

Before

After

RESTORATION CONCEPTS cont.

Restoring Connectivity



<u>Consider</u>

Buffers
Corridors
Stepping Stones
Landscape
& Seascape Mosaic

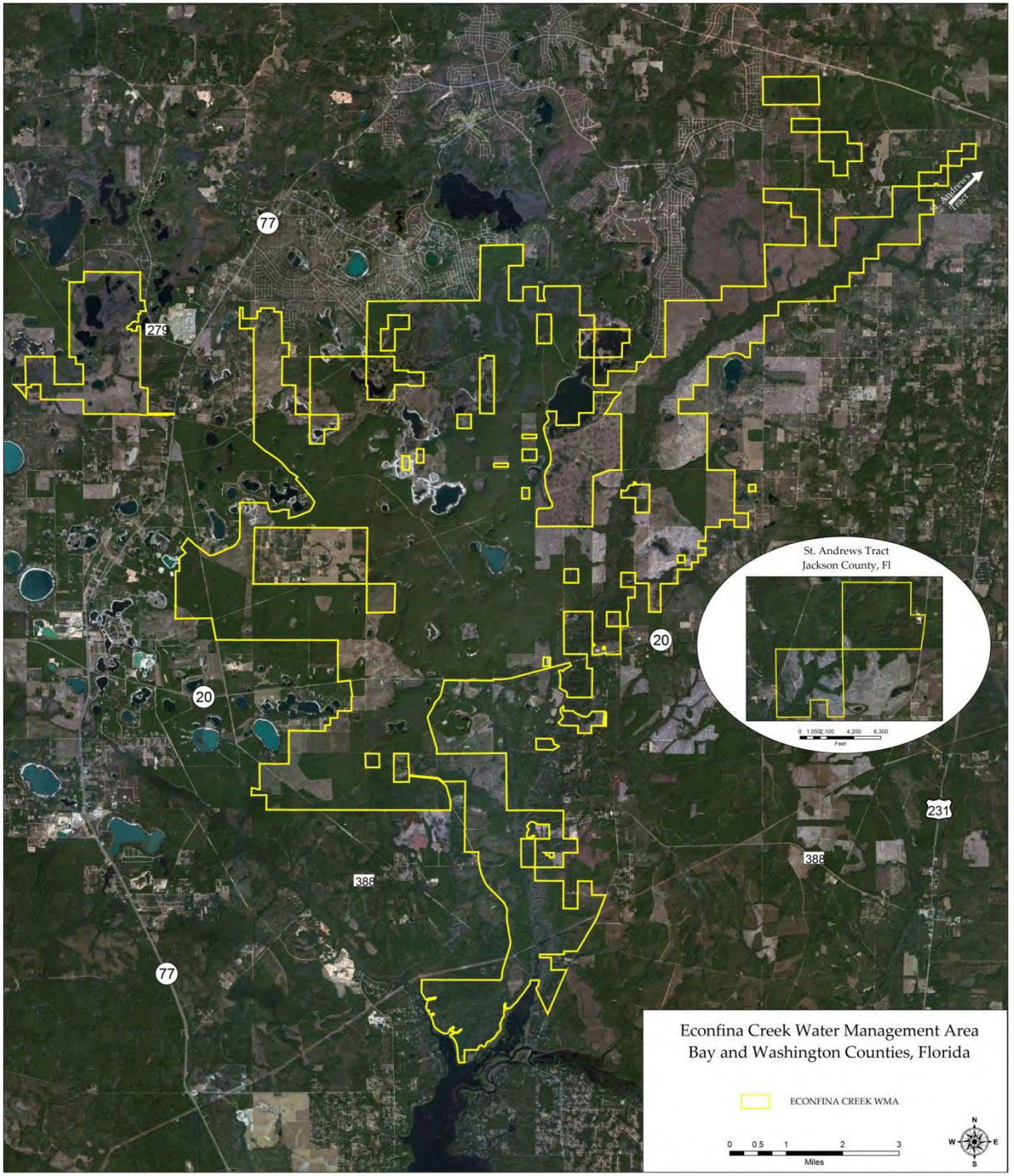
Principles and Guidelines of Restoration

***Effective** ecological restoration is restoration that re-establishes and maintains the values of a protected area*

- 'Do no harm' by first identifying when restoration is the **best option**
- **Re-establish ecosystem structure, function and composition**
- Maximize the contribution of restoration actions to **enhancing resilience** (e.g., to climate change)
- Restore **connectivity within and beyond** the boundaries of protected areas
- Encourage and re-establish **traditional cultural values and practices** that contribute to the **ecological, social and cultural sustainability** of the protected area and its surroundings
- Use **research and monitoring, including from traditional ecological knowledge**, to maximize restoration success

Re-establish ecosystem structure, function and composition
(restore sand pine plantations to natural longleaf pine/wiregrass)

enhancing resilience
(natural longleaf pine/wiregrass can adapt better to climate change and uses less water)



connectivity within and beyond
(creek, springs & recharge area)

traditional cultural values and practices
(hunting, fishing & recreation)

research and monitoring
(adaptive management)

Principles and Guidelines of Restoration cont.

Efficient *ecological restoration for protected areas is restoration that maximizes beneficial outcomes while minimizing costs in time, resources and effort*

- Consider restoration goals and objectives from **system-wide to local scales**
- Ensure **long-term capacity and support** for **maintenance and monitoring** of restoration
- Enhance **natural capital and ecosystem services** from protected areas while contributing to nature conservation goals
- Contribute to **sustainable livelihoods** for **local communities** dependent on the protected areas
- Integrate and coordinate with federal, state and local **development policies** and **programming**

Minimizing Costs, Resources and Effort

Off Site Timber Revenue Pays for Restoration and Long-term Management

Off Site Sand Pine

Restored Longleaf Pine

Principles and Guidelines of Restoration cont.

Engaging *ecological restoration for protected areas is restoration that collaborates with partners and stakeholders, promotes participation and enhances visitor experience*

- **Collaborate** with local communities, neighboring landowners, corporations, scientists and other partners and stakeholders in planning, implementation, and evaluation

- **Learn collaboratively** and **build capacity** in support of continued engagement in ecological restoration initiatives

- **Communicate effectively** to support the overall ecological restoration process

- Provide **rich experiential opportunities**, through ecological restoration and as a result of restoration, that encourage a **sense of connection** with and **stewardship** of protected areas

Canaveral National Seashore: Conservation agencies and volunteers collaborate in making and deploying oyster mats to restore an intertidal oyster reef.

Best Practices
Key Messages

- **Identify major factors causing degradation**—undertaking restoration without tackling underlying causes is likely to be fruitless

- **Set clear restoration objectives**—it may not be appropriate to aim for a 'pristine' or 'pre-disturbance' state, particularly under conditions of rapid environmental (e.g., climate) change

- **Ensure a participatory process** involving all relevant stakeholders and partners in planning and implementation, facilitating participation and shared learning, contributing to acquisition of transferable knowledge, improving visitor experiences, and celebrating successes

- Recognize that some objectives or motivations for restoration **may conflict** and work collaboratively to prioritize among them

- Ensure that the **time frames** for the objectives are clear

Best Practices

Key Messages cont.

- Assess the possible impacts of climate change and other large-scale changes on the feasibility and durability of restoration and try to **build resilience**
- Ensure that **monitoring** addresses the full range of restoration objectives and the intermediate stages needed to reach them
- Use monitoring results and other feedback in **adaptive management**
- Restore, where possible, **ecosystem functioning** along with physicochemical conditions and **hydrology**
- **Consider** natural capital, **ecosystem services**, disaster risk reduction and climate change mitigation and adaptation
- **Identify potential negative impacts** of the restoration program and take action to limit or mitigate them as much as possible
- **Identify** and where possible **control external factors** such as pollution that may compromise restoration efforts

Adapt! Adapt! Adapt!

Wiregrass Donor Site

Research Indicated That Seed Collected Begin Two Weeks Earlier

Effective Habitat Improvement or Restoration Principles to Consider to Re-establish and Maintain Values

Habitat improvement or restoration is expensive and time-consuming and can further damaging changes if not managed correctly

- ✓ Make any decision to improve or restore habitat based on clear evidence that there is **real ecological degradation** and that the **values** of the site or area will not be regained through **natural processes, e.g. fire**.

- ✓ **Adopt precautionary approaches** to avoid restoration processes causing **inadvertent damage**, e.g. damaged caused by heavy equipment in sensitive areas.

- ✓ **Allow** the protected area to **recover naturally** where further degradation from other factors is unlikely; or **introduce management** to prevent other factors that are present from limiting recovery, e.g. area gets disturbed by a tropical storm – nature process and habitat improvement or restoration may takes decades, but cost is low. **Also, consider enhancement activities**, e.g. bald cypress planting.

- ✓ **Restore** or **mimic**, where possible, natural disturbances such as **fires** and floods to approximate natural severity/frequency, e.g., reduce impacts of fire suppression.


Prescribed Fire
Most Cost Effective & Efficient
Habitat Improvement
and
Maintenance Tool

Effective Habitat Improvement or Restoration Principles to Consider to Re-establish and Maintain Values cont.

- ✓ Determine if the habitat type requires **manmade or natural disturbances** to exist or be maintained in a specific successional stage.

  Examples: Mixed Bottomland Hardwood Habitat (usually Category 4 or 5 Hurricane replacement, e.g. Hurricane Ivan)

  Wet Prairie Habitat - Fire dependent (burn every 3-5 years)

  Sandhill Habitat - Fire maintained (burn every 3-5 years)

- ✓ **Control of invasive exotic species**, e.g. Chinese Tallow tree, Cogon grass, Kudzu , etc.

- ✓ Focus **efforts** on managing invasive exotic species that **compete** with ecologically important **native species** or exotic species that **alter ecological processes**, e.g. Japanese Climbing Fern.

- ✓ **Control** of invasive exotics or undesirable plant species can be **mechanical** (physically removing the invasive species), **chemical or biological.** If chemical or biological controls are considered to be essential, ensure best practices for human health and to avoid environmental side effects on non-target species. *For example, in disturbed wet prairie habitats, if prescribed fire is prohibitive, then mechanically eradicate hardwoods, herbicide cut stumps, but **do not utilize a herbicide** that is **detrimental to grasses, herbs and forbs**.*

Chinese Tallow
(Popcorn Tree)

Bamboo

Mimosa

Kudzu Vine

Chinese Privet

Coral Ardesia

Air Potato

Oleander

Tung Tree

Chinaberry

Effective Habitat Improvement or Restoration Principles to Consider to Re-establish and Maintain Values cont.

- ✓ Recognize and consider **micro-sites** for protection or improvement or restoration to enhance or maintain **habitat diversity**.

- ✓ Planting **'keystone'** species that play a particularly important role in helping to restore a habitat or ecosystem, e.g. longleaf pine and wiregrass.

- ✓ Plant **native species** – Overstory species (trees) are readily available, but many groundcover species , i.e. grasses, herbs and forbs are not commercially grown as **seed is the limiting factor** and propagation methodology and techniques are not known, e.g. wetland wiregrass, toothache grass, wetland sunflower species.

- ✓ Wetland habitat – If possible, restore natural **topography, hydrology and flow regimes**, i.e. restore the site's hydrology.

- ✓ Continually **monitor and evaluate** the impacts of all habitat improvement or restoration activities against your goal(s).

Wetland Wiregrass

Manage Donor Site
Collect Seed
Test Seed
Contract Grow

Efficient Habitat Improvement or Restoration That Maximizes Beneficial Outcomes While Minimizing Costs in Time, Resources and Effort

- ✓ Consider/analyze **risks, costs and benefits of restoration** versus **other management strategies and factors** such as likelihood of support from key stakeholders.

- ✓ At the species or biological community level, **identify criteria** to prioritize habitat improvement or restoration needs **for species**, including factors associated with the conservation of **rare, threatened and endange**red species.

- ✓ Choose **indicators and methods** that can be **monitored cost-effectively** for the long time period required for many restoration programs.

- ✓ Develop clear **restoration protocols for monitoring**, so that monitoring can remain constant through changes of responsible staff.

- ✓ Plan monitoring protocols with **involvement of specialists**. The effects of restoration cannot be separated from natural fluctuations without clearly stating questions, collecting data and conducting well-planned analyses.


Iris


Parrot
Pitcher Plant


Dwarf Witch
Hazel

Efficient Habitat Improvement or Restoration That Maximizes Beneficial Outcomes While Minimizing Costs in Time, Resources and Effort cont.

- ✓ Plan habitat improvement or restoration projects so that the improvement or restoration **actions can be adapted (see adaptive management) according to the feedback from monitoring**.

- ✓ Ensure that monitoring processes are **participatory and results are transparent**.

- ✓ Develop an **implementation plan** in collaboration with stakeholders and partners that:

  (i) identifies the **rationale** for restoration priorities;
  (ii) lists intended **outcomes**;
  (iii) lays out **steps needed** for restoration; and
  (iv) explains the intended **monitoring** system.

- ✓ Work with protected area managers, local communities, and other partners and stakeholders to identify **critical biodiversity components and ecosystem services** supplied by the protected area that can be restored for **livelihood benefits, e.g. sustainable timber production** in a manner consistent with conservation aims, even when restoration aims primarily at restoring natural values.

Engaging in Habitat Improvement or Restoration That Collaborates With Partners and Stakeholders, Promotes Participation and Enhances Visitor Experience

- ✓ Spend time **at the start** of the habitat improvement or restoration project to **build relationships and understand partner and stakeholder perceptions and priorities.**

- ✓ **Identify and engage** the full range of partners and stakeholders with an interest in the restoration, including all who will be affected, even if geographically distant from the project.

- ✓ Ensure the **ecological rationale for habitat and species management is fully understood and supported by the public and other stakeholders**, that they are encouraged to participate as appropriate, and that effective communication continues throughout.

- ✓ **Communicate effectively** to support the overall ecological restoration process.

  Examples: Hold public workshops , signage, opportunities for visitor experience, use volunteers, etc.


Spring Restoration Workshop & Sneak Peak

Habitat Improvement or Restoration Process

Define the Problem and Engage Stakeholders

Assess the Problem

Develop Ecological Restoration Goals

Develop Ecological Restoration Objectives

Design Ecological Restoration Approach

Implement Ecological Restoration Approach

Manage Adaptively: Monitor, Evaluate, Adjust, Communicate


Questions?

Thank You

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