GCPO LCC Ecological Assessment

Steering Committee Update
October 21, 2014
GCPO LCC Steering Committee Fall Meeting
Destin, FL
GCPO LCC Mission

Define

Design

Deliver

Monday, October 27, 14
Pathway to a Conservation Blueprint
Pathway to a Conservation Blueprint

How do we get from define to design?
Pathway to a Conservation Blueprint

How do we get from define to design?

Landscape is large
&
Information is limited
Pathway to a Conservation Blueprint

How do we get from define to design?

Landscape is large & Information is limited

Step 1: Assess state of the information Assess state of the system
GCPO Science Priorities

Operational subgeographies

- Priority ecological systems
- Desired ecological states
- Landscape endpoints
  - Amount
  - Configuration
  - Condition
  - Temporal
- Species endpoints

Monday, October 27, 14
GCPO Science Priorities

Operational subgeographies

Priority ecological systems

Desired ecological states

Landscape endpoints

- Amount
- Configuration
- Condition
- Temporal

Species endpoints

DRAFT v4
Integrated Science Agenda
Gulf Coastal Plains & Ozarks
Rapid Ecological Assessment

Objectives
- How much habitat is in desired ecological state?
- How much more habitat is needed?
- Where is habitat in desired ecological state?
- Where are opportunities to manage?

Phases
- Phase I – Landscape Endpoints
- Phase II – Species Endpoints

Outcomes
- Comprehensive “State of the GCPO” report
- Baseline information for conservation design
Ecological Assessment Approach

Ingredients

Cake
Ecological Assessment Approach
Ecological Assessment Approach

Ingredient

Red-headed woodpecker
Swainson’s warbler/Hooded warbler

Cake

Black Bear
3-tiered report structure:

- Comprehensive (200+ pgs)
  - Abbreviated (~20 pgs)
  - Executive Summary (<4 pgs)

Chapter structure:

- Subgeography Intro
  - Ecological System Intro
  - Landscape Endpoints
    1. Data Sources and Processing Methods
    2. Summary of Findings
    3. Future Directions and Limitations
    4. Tables and Figures
    5. Linkages to GCPO LCC CPA
### Phase I Progress Update

- **Terrestrial Landscape Endpoints (Evans/Gray)**
- **Aquatic Landscape Endpoints (Allen)**
- **System-specific initial review**

<table>
<thead>
<tr>
<th>Subgeography</th>
<th>System</th>
<th>Staff</th>
<th>1st Draft Timeline</th>
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<tbody>
<tr>
<td>MAV</td>
<td>Forested Wetlands</td>
<td>Evans</td>
<td>Aug 2014</td>
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<td></td>
<td>Big River Systems</td>
<td>Allen</td>
<td>Dec 2014</td>
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<td>E/WGCP</td>
<td>Open Pine</td>
<td>Gray</td>
<td>Nov 2014</td>
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<td>Prairie Grasslands</td>
<td>Gray</td>
<td>Jan 2015</td>
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<td>M-L Gradient Streams/Rivers</td>
<td>Allen</td>
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<td>GC</td>
<td>Tidal Marsh</td>
<td>Evans</td>
<td>Dec 2014</td>
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<td></td>
<td>Beaches/Dunes</td>
<td>Evans</td>
<td>Feb 2015</td>
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<td>OZHI</td>
<td>Upland Hardwoods</td>
<td>Evans/Gray</td>
<td>Mar 2015</td>
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<td>Allen</td>
<td>Feb 2015</td>
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</table>
MAV Forested Wetlands

Mississippi Alluvial Valley
- Forested Wetlands
  - 3.7 M acres
  - Extensively forested local (>10,000 ac) landscapes
  - Contiguous forest patches
    - 13 patches >100K ac
    - 36 patches >20K ac
    - 52 patches >10K ac
  - 60-70% overstory canopy
  - 25-40% midstory/understory cover
  - Basal area (60-70 ft²/ac)
  - 60-70% tree stocking
  - >26" dbh snags: 0.2/ac
  - Tree species diversity
  - Cane/overstory vine
  - Natural flow patterns
  - 10% early successional

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Basal Area

Target: 60–70 ft²/ac

Data Sources: NLCD, USFS total live tree basal area

Results:

- ≈444,000 ac MAV forested wetlands in target range.
- ≈2.7 million ac >70 ft²/ac (≈700K ac on protected lands)

Target Basal Area (60–70 ft²/ac)  
Basal Area >70 ft²/ac
Canopy Cover

**Target:** 60–70% canopy cover

**Data Sources:** NLCD, NLCD/USFS tree canopy cover

**Results:**
- ≈205,000 ac MAV forested wetlands in target range.
- 4.5 million ac >70% canopy (~1.1 mill ac on protected lands)
Other Condition Metrics

Large snags (>26” dbh): 0.2/acre

Tree stocking: 60–70%

Diverse tree species composition

MAV FW county mean: 0.21/ac

MAV FW county mean: 61%
34% MAV counties met FW target

MAV FW county mean: 6 species

~18 bottomland/forested wetland FIA plots/county in the MAV

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MAV Forested Wetland Amount

**Amount:** 3.7 million acres

**Data Sources:** NLCD, USFS total live tree basal area, NLCD/USFS tree canopy cover

**Results:**
- NLCD Woody Wetlands (all conditions)
  - ~5.3 million ac total
  - ~1 million ac protected
- NLCD Woody Wetlands w/60–70% canopy cover & 60–70 ft²/ac basal area
  - ~12,000 ac total
  - ~1,500 ac protected
MAV Forested Wetlands

Mississippi Alluvial Valley

Forested Wetlands

Amount
3.7 M acres
Extensively forested local (>10,000 ac) landscapes
Contiguous forest patches

Configuration
13 patches >100K ac
36 patches >20K ac
52 patches >10K ac

Condition
60-70% overstory canopy
25-40% midstory/understory cover
Basal area (60-70 ft²/ac)
60-70% tree stocking
>26” dbh snags: 0.2/ac
Tree species diversity
Cane/overstory vine
Natural flow patterns
10% early successional

Temporal

Data Availability/Quality

Monday, October 27, 14
Aquatic Landscape Endpoints
Medium-Low Gradient Streams and Rivers - East and West Gulf

**Amount:** Maintain current river miles

**Configuration:**
- Lateral connectedness
  - functional connectivity to floodplain habitats
- Linear connectedness
  - functional connectivity of a stream network

**Condition:**
- Temperature – below critical threshold
- Adequate magnitude with limited frequency of low flows
- Natural riffle–pool sequences
- Meandering channels with natural sinuosity
- High amounts of small woody debris
- Adequate amounts of large woody debris
- Diversity of substrates, including gravel beds and sandbars
Aquatic Landscape Endpoints

Medium-Low Gradient Streams and Rivers – East and West Gulf Coastal Plain

Amount: **Maintain current river miles**
Data Source: NHDPlus v2
Definitions: Include: low-gradient (SARP <0.02)

Results:
East Gulf Coastal Plain 111,727 km
West Gulf Coastal Plain 94,085 km

Both approx. 0.44 km/km²

Data Limitations:
- medium resolution data
- accuracy of inputs
- temporal change to network
Aquatic Landscape Endpoints
Medium-Low Gradient Streams and Rivers – East and West Gulf Coastal

Configuration: **Lateral Connectedness** – functional connectivity to floodplain
Data Source: Inundation Frequency
Definitions: Include: 10–90%

Results:
East Gulf Coastal Plain 9,656 km²
West Gulf Coastal Plain 9,149 km²

Both approx. 4% of total subgeography

Data Limitations:
• 30m resolution
• Temporal changes

Monday, October 27, 14
Aquatic Landscape
Endpoints
Medium-Low Gradient Streams and Rivers – East and West Gulf Coastal

Configuration: Linear Connectedness – functional connectivity of a stream network
Data Source: 2012 National Anthropogenic Barriers Database (NABD)
Definitions: dams falls within 10m of MLG

Results:

<table>
<thead>
<tr>
<th></th>
<th>Count</th>
<th>Mean Height</th>
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<tbody>
<tr>
<td>East Gulf Coastal Plain</td>
<td>984</td>
<td>(21 ft)</td>
</tr>
<tr>
<td>West Gulf Coastal Plain</td>
<td>743</td>
<td>(33 ft)</td>
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</table>

Both approx. 0.003 dams/km²

Data Limitations:
- accuracy
- completeness
  SECAP - found 4x more barriers

Monday, October 27, 14
Aquatic Landscape
Endpoints
Medium-Low Gradient Streams and Rivers – East and West Gulf Coastal

Condition: **Temperature – below critical threshold**

Data Source: PRISM Climate Grid (1980–2010)

Definitions:
- August Mean Air Temp
- August Max Air Temp

Results:
- August Mean Air Temp > 28°C

East Gulf Coastal Plain 6 km
West Gulf Coastal Plain 23,842 km

Data Limitations:
- endpoint specificity
- ability of air temp to predict water temp (esp. for spring-fed and reservoir release)
Aquatic Landscape
Endpoints
Medium-Low Gradient Streams and Rivers – East and West Gulf Coastal Plain

Condition: Natural Sinuosity
Data Source: NHDPlus v2,
Definitions: for each reach:
shortest dist /actual dist
“Good” < 0.90

Results:
East Gulf Coastal Plain 58% “Good”
West Gulf Coastal Plain 77% “Good”

Data Limitations:
• endpoint specificity
• medium resolution NHD
Endpoints with little / no available data source:

Condition: Adequate amounts of small woody debris
Data Limitations: flow will greatly affect transport of SWD.

Condition: Diversity of substrates
Data Limitations: how to scale up local data collection to landscape scale?
  (low cost sidescan sonar mapping)

Condition: Natural riffle–pool sequences
Data Limitations: how to scale up local data collection to landscape scale?
  ▼ (bathymetric mapping)
Aquatic Landscape Endpoints – Data Availability and Medium–Low Gradient Streams and Rivers – East and West Gulf Coastal Plains

- Maintain current river miles
- Lateral connectedness
- Linear connectedness
- Temperature
- Adequate Flows
- Large woody debris
- Natural sinuosity
- Natural riffle–pool sequences
- Diversity of substrates
- Small woody debris
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Maintain current river miles
Lateral connectedness
Linear connectedness
Temperature
Adequate Flows

Large woody debris
Natural sinuosity
Natural riffle–pool sequences
Diversity of substrates
Small woody debris
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Maintain current river miles

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Adequate Flows

Large woody debris

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Maintain current river miles

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Maintain current river miles
Lateral connectedness
Linear connectedness
Temperature
Adequate Flows

Large woody debris
Natural sinuosity
Natural riffle–pool sequences
Diversity of substrates
Small woody debris

Are these the right endpoints?
Are these the right thresholds?
Do they work together to inform conservation design?
Aquatic Landscape Endpoints –

Mainstem “Big” Rivers
Mississippi Alluvial Valley

Amount: maintain current river miles

Configuration: main channel
secondary channels
off channel refugia
seasonally inundated floodplains

Condition: seasonally appropriate DO
seasonally appropriate temperature
adequate flows
Systems In Progress

Gulf Coast

Beaches and Dunes
- 138,500 acres
- Functional connectivity beach/dune systems
- Undisturbed dune habitats
- Presence primary, secondary, tertiary dunes
- 20-50% dune vegetative cover
- 10-20' dune width
- Dune height
  - 2'-4' primary
  - 4'-6' secondary
  - >6' tertiary
- 18-45 degree dune slope
- Presence: sea oats, bitter panicum, Spartina patens

Tidal Marsh
- Adequate marsh acreage
- Large blocks unbroken marsh
- Connectivity/interdigitation marsh types
- Moderate edge w/in marsh blocks
- Riverine barrier islands
- >70% emergent vegetation
- <20% open water
- 15-30% SAV
- Native plant dominance
- Natural salinity gradient
- Freshwater flow/tidal influence

East/West Gulf Coastal Plains

Open Pine Woodland/Savanna
- 20 M acres
- Large, interconnected pine woodland/savanna blocks
- Forest patch size >600 ac
- <9 km patch connectivity

Grassland-Prairie-Savanna
- 100,000 acres
- Large patches of prairie
- 5 patches >10,000 ac
- 500 patches >100 ac

4-6' vegetation height
- Near 100% vegetation density
- 5-20% bare ground
- <20% shrub cover
- Tree density <10/ac
- NWSG/forb dominance
- 5 yr disturbance interval
- 20% area disturbed annually
Vague Language:
- “Seasonally appropriate DO”
- “Temperature below critical threshold”
- “Adequate flows”

Uncertain biological basis:
- “3.7 million acres”
- “Diverse tree species composition”
- “Temperature below critical threshold”

Difficult to measure:
- “Dominated by NWSG and forbs”
- “Bare ground >5% but <20%”
- “Variety of substrates – gravel to boulders”

**Science Agenda and Ecological Assessment = living documents intended to be adaptive**
What’s Next: Species Endpoints

- Identify existing data/models and data gaps
- Support development of species–habitat models
  - Targets:
    - GCPO landscape–scale
    - Additive value
    - Poorly understood habitat relationships
Discussion and Decision Items

1. Landscape Endpoint Specificity
   - Endpoints are hypotheses to be tested;
   - Some endpoints are vaguely defined, have limited biological basis, or are difficult to measure;
   - Recommendation of a reconvening of the ASMT to assess and revise/refine landscape (and species) endpoints if needed.

2. Assessment Expectations: Ingredients vs. Cake
   - Individual landscape endpoints (the ingredients) have been assessed;
   - We have not combined data from endpoints to identify complete intact systems (the cake).
   - Steering committee expectation – ingredients or cake or both?

3. Data Acquisition Priorities
   - Assessment has identified key data gaps;
   - Opportunities for LCC to work with partnership to prioritize data acquisition
   - Steering committee guidance on role of LCC – generating data, supporting development, guiding partnership development.

4. Snapshot Document
   - What is the greatest value of a short snapshot document – an assessment of the state of the data or an assessment of the landscape configuration for each endpoint?
Landscape Endpoint Opportunities

Vague Language:
- “Seasonally appropriate DO”
- “Temperature below critical threshold”
- “Adequate flows”

Uncertain biological basis:
- “3.7 million acres”
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- “Dominated by NWSG and forbs”
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- “ Variety of substrates – gravel to boulders”

**Science Agenda and Ecological Assessment = living documents intended to be adaptive**
Ecological Assessment Role

Ingredients

Cake
Data Acquisition

Far Horizon

LCC Generates

Lateral connectivity

Dune Height

LCC Supports

Cane/Vines

Temp

DO

Flow

Tree Stocking

DO

Tree Density

Substrates

Snag density

Bare ground

Midstor

SWD

Dune Height

Lateral connectivity

Temp

Cane/Vines

Flow

DO

Tree Stocking

Substrates

Snag density

Understory

Midstor

SWD

Bare ground

Monday, October 27, 14
Reporting

3-tiered report structure:
- Comprehensive (200+ pgs)
- Abbreviated (~20 pgs)
- Executive Summary (<4 pgs)

What is the greatest value of a short snapshot/executive summary document?
- An assessment of the state of the data? or
- An assessment of the landscape condition for each endpoint?
Thanks!

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Process Example
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