

Surrogate Species Selection and Population Objectives

Perspectives from the Atlantic
Coast Joint Venture



Atlantic Coast Joint Venture

ACJV



- A partnership focused on the conservation of habitat for native birds in the Atlantic Flyway of the United States from Maine south to Puerto Rico.
- 18 states and commonwealths and key federal and regional habitat conservation agencies and organizations

Designing Sustainable Landscapes

- Develop a methodology for assessing and **designing landscapes for sustainable populations** of birds [and other wildlife] in the SAMBI area that can be applied in other areas of the eastern United States.
 - **Prioritizes landscape based on current and potential future conditions**
 - **Conservation implementation on the priority areas is expected to result in target populations of birds associated with these ecosystems. (SURROGATE SPECIES)**
 - **Selection of areas based on fundamental concepts of landscape ecology and conservation biology.**
 - **Can be updated periodically as new data become available.**

Three Major Objectives

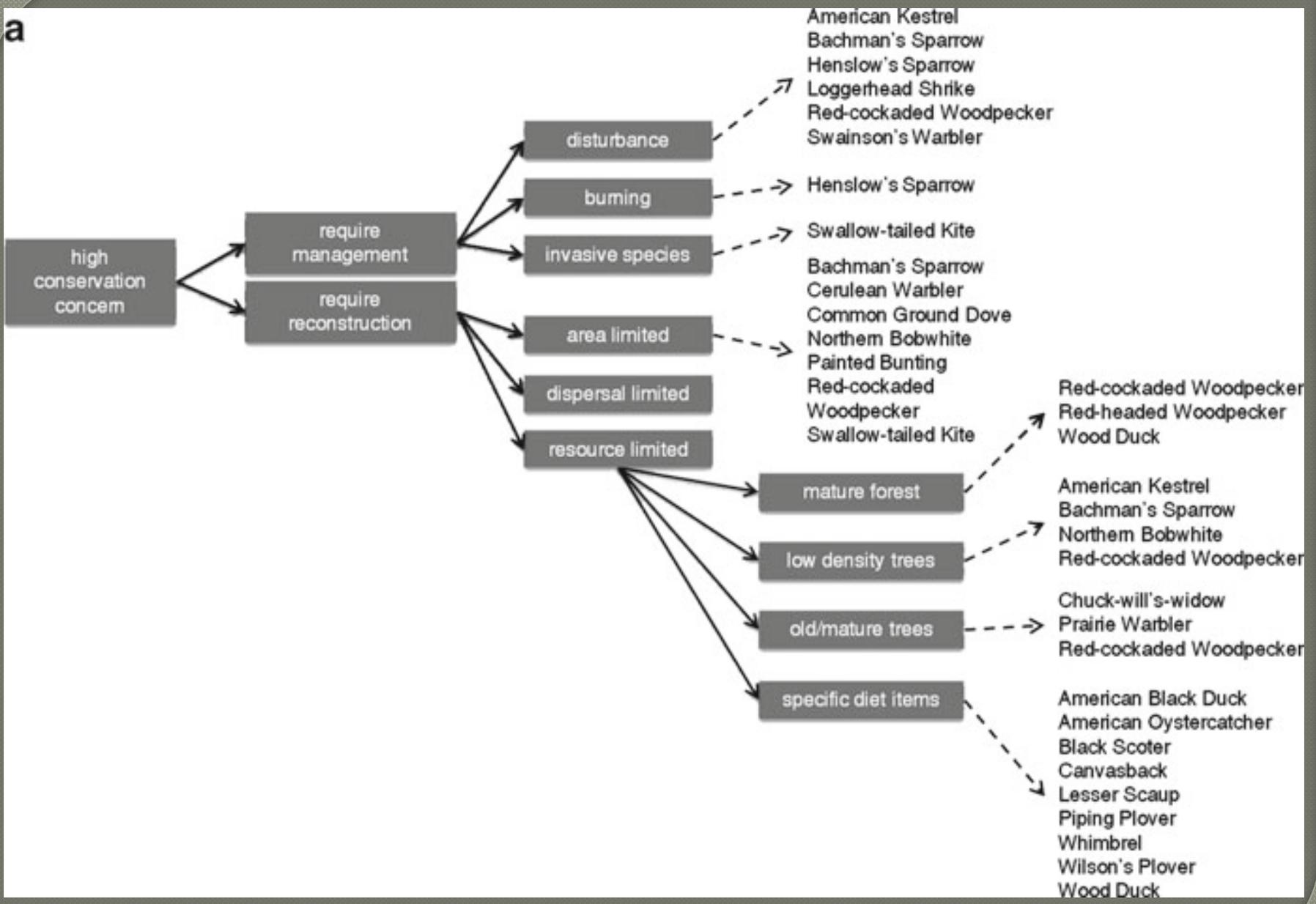
- to assess the current ability of habitats to sustain avian populations;
- to model future conditions based on projected urban growth, conservation programs, and climate change and predict the response of avian populations;
- to enhance coordination among stakeholders during all planning stages.

Methods to Select Species

Lambeck's (1997) selection process

- modified umbrella species concept
 - systematically select species based on threat category--emphasis on protecting the most sensitive species
- method used empirical data from published literature and field research
- modified to accept qualitative expert data
- focus on landscape design and management

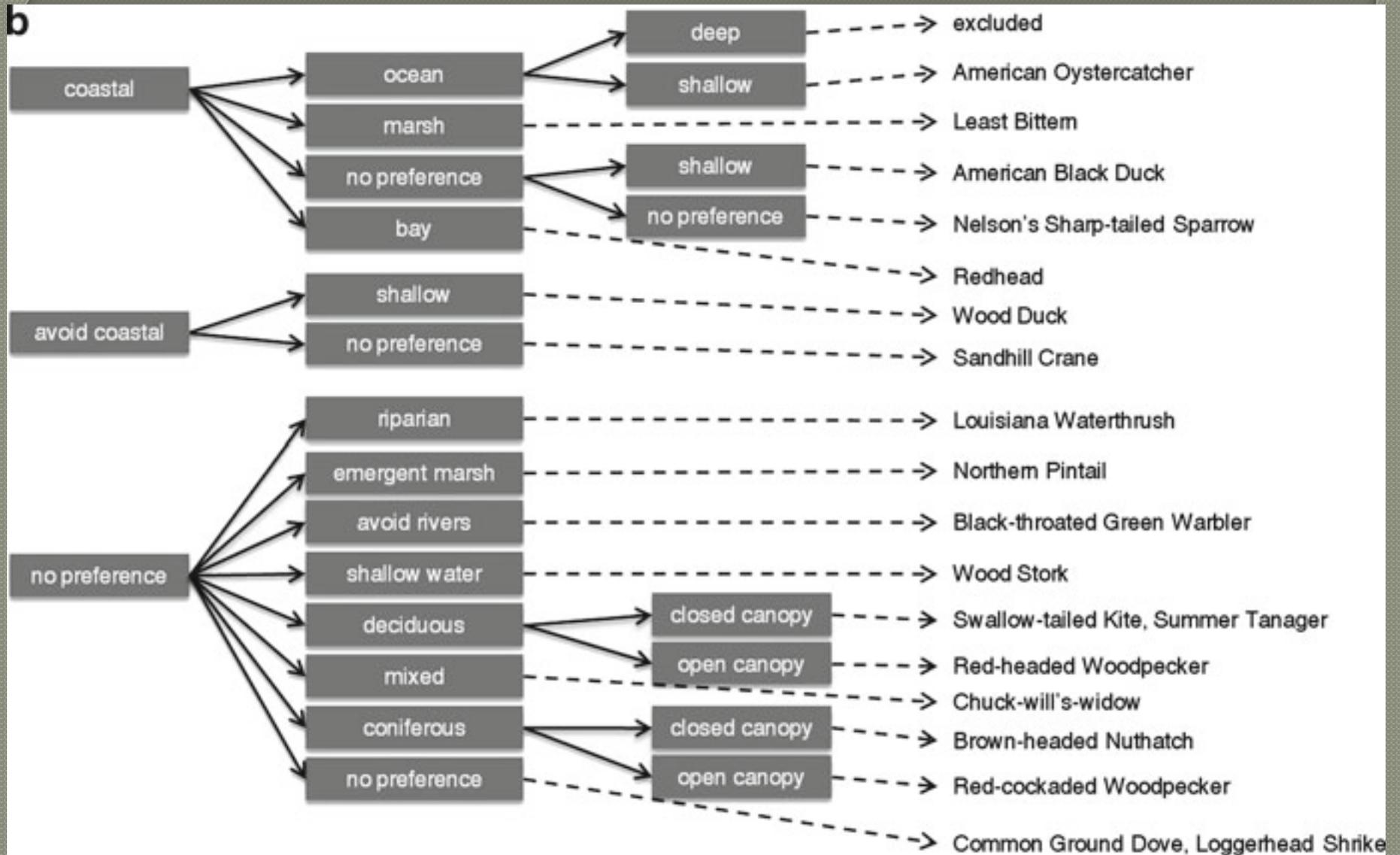
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Methods to Select Species

Structured decision making (SDM).

- Five-step procedure for solving problems
- Define and solve resource management issues
- Three workshops held in 2008
- Representatives of partnership invited to send subject matter experts
 - Follow-up surveys
- Habitat as objectives; species as alternatives



Results of SDM Process

- 12 Major Habitat Types in SAMBI region
 - Shrub-scrub
 - Open pine
 - Alluvial forested wetland
 - Freshwater wetland
 - Grassland
 - Non-alluvial forested wetland
 - Maritime forest
 - Estuary
 - Beach
 - Longleaf pine
 - Upland forest
 - Slope forest

Results of SDM Process

- 40 species selected for 12 habitat types
 - Shrub-scrub
 - Bachman's sparrow
 - Field sparrow
 - Henslow's sparrow
 - Northern bobwhite
 - Prairie warbler
 - Open pine
 - Bachman's sparrow
 - Brown-headed nuthatch
 - Field sparrow
 - Northern bobwhite
 - Prairie warbler
 - Red-cockaded woodpecker

Waterfowl Population Objectives

State	Scaup	NOPI	MALL	ABDU	AGWT
Connecticut	5,459	2,237	17,465	8,101	1,529
Delaware	6,586	14,469	24,593	12,931	10,191
Florida	175,118	36,759	4,743	1,115	21,283
Georgia	73,932	13,485	49,509	4,762	14,689
Maine	8,715	7,028	17,507	15,214	5,579
Maryland	145,156	29,936	88,214	38,147	17,849
Massachusetts	2,599	3,599	13,003	9,489	1,763
New Hampshire	2,734	2,944	8,470	4,599	1,262
New Jersey	26,854	13,110	26,532	27,741	9,761
New York	90,635	44,811	132,773	57,587	15,722
North Carolina	284,819	62,103	90,159	30,318	31,599
Pennsylvania	59,106	28,196	137,786	36,641	12,707
Rhode Island	4,662	764	2,790	3,221	293
South Carolina	70,193	25,948	50,314	11,555	24,379
Vermont	5,502	4,886	14,728	5,240	2,496
Virginia	90,132	36,037	87,350	37,472	12,803
West Virginia	796	1,031	7,876	2,813	581
AF Objective	1,052,998	327,343	773,812	306,946	184,486

Lesson Learned – Surrogate Species Selection

- Neither method produced adequate list of surrogate species
- Combining expert opinion review of both lists produced best list (fine scale details)
- Need for common language for species and objective terminology
- Selection criteria are critical
- Validation of lists with on-line surveys (repeatability issues)

Lesson Learned – Population Objectives

- Technique will vary across species/
species groups
- For species with continental objectives
 - Use empirical data if available
 - If no empirical data, then use best available information (e.g., expert opinion)
- For species without continental objectives
 - Estimate based on habitat availability
 - Or other population estimate

Overall Lessons Learned

- No one process begins at the same place, each process has it's own "process" and needs to be adaptive
- Develop decision context first
 - Base selection criteria on well defined questions
- More specificity in habitat classes
 - More classes

Overall Lessons Learned

- Select surrogates that encompass the full annual requirements of a functioning landscape
- Develop monitoring plan
 - To monitor effects of management on surrogate species
 - To determine whether the surrogate species selected actually represent other species

More Information

- Allison T. Moody and James B. Grand
- 2012
- Incorporating Expert Knowledge in Decision-Support Models for Avian Conservation
- In Expert Knowledge and Its Application in Landscape Ecology
- Eds: A. Perera, C. Drew, and C. Johnson

Species selection

- Determine which species should be used to design landscapes
- Classify surrogacy of each species
 - **Flagship** – charismatic species that attract public support
 - **Umbrella** – species that require large areas of habitat, thus conferring protection to other species
 - **Biodiversity**– presence may indicate high species richness
 - **Keystone** – species that are critical...
- Determine habitat characteristics for each species

Structured Decision Making Workshops

- Three workshops held in 2008
- Representatives of partnership invited to send subject matter experts
- Facilitated elicitation of responses
- Species suite that would represent all habitat types defined by the SAMBI Plan
- Used habitat characteristics as objectives
 - potential focal species as alternatives
 - based on their association with each habitat characteristic

Results of SDM Process

- 40 species selected for 12 habitat types
 - Maritime Forest
 - Common ground dove
 - Northern parula
 - Painted bunting
 - Prairie warbler
 - Yellow-throated warbler

Objectives

Habitat	Characteristics
Hydrological	Coastal
	Water type
	Water depth
	Salinity
	Presence of submerged aquatic vegetation
	Aquatic macroinvertebrates
	Turbidity
	Flooding
	High-energy shore
	Low-energy shore

Objectives

Habitat	Characteristics
Disturbance	Any
	High fire frequency
	Growing season fires
Vegetation	Canopy cover
	Mid-story
	Understory
	Low basal area
	Old or mature trees
	Mature forest
	Bare ground

Objectives

Habitat	Characteristics
Other	Patch size
	Social aggregation
	Large forest patch
	Elevation
	Urban avoidance
	Edges
	Large home range
	Invasive speceis

Assessing consequences

Species	Habitat Characteristics									
	Low % Canopy Cover	Diverse, Herb- aceous Under- story	Low Basal Area/ Tree Density	Old trees	Snags	Large Patch Size	High Fire Frequency	Growing Season Fire	Bare Ground	Wet Savannah/ Bogs
BASP	X	X	X				X	X		
BRNU			X	X	X					
HESP	X	X	X				X	X		X
NOBO	X	X	X			X	X		X	
RCWO	X		X	X	X	X				
AMKE	X		X		X	X				

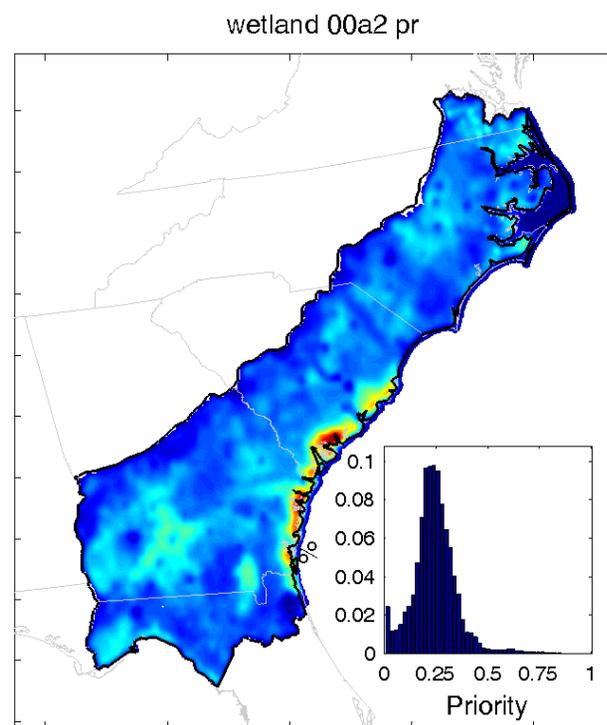
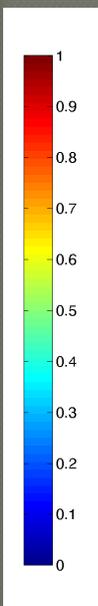
Evaluating SDM Process

- Compared species selection using Lambeck method
 - Modified umbrella species selection
 - Emphasizes most sensitive species
- Uses empirical data
 - Published literature
 - Field research

Results of SDM Process

- 40 species selected for 12 habitat types
 - Alluvial forested wetland
 - Black-throated green warbler
 - Cerulean warbler
 - Prothonotary warbler
 - Swainson's warbler
 - Swallow-tailed kite
 - Wood duck
 - Yellow-throated warbler

Habitat priorities



Population Objectives

Recent Developments

- Translating Black Duck objectives to habitat objectives
- Began process for developing population objectives for other bird groups; wading birds, shorebirds, landbirds, including breeding waterfowl
- 3 groups formed; waterfowl, landbirds, and waterbirds

Recent Developments

- Representative species to be chosen for each group
- Should relate to SAMBI DSL, NALCC, SALCC, USFWS efforts
- Each group look at existing continental objectives and density/abundance estimates
- Goal is to have draft objectives for these groups and species by winter 2013 meetings

Recent Developments

- Waterfowl – Wood Duck, Black Duck, Mallard (AFTS)
- Landbirds – Louisiana Waterthrush, Prairie Warbler, Wood Thrush (DSL and NALCC)
- Waterbirds – not yet selected;