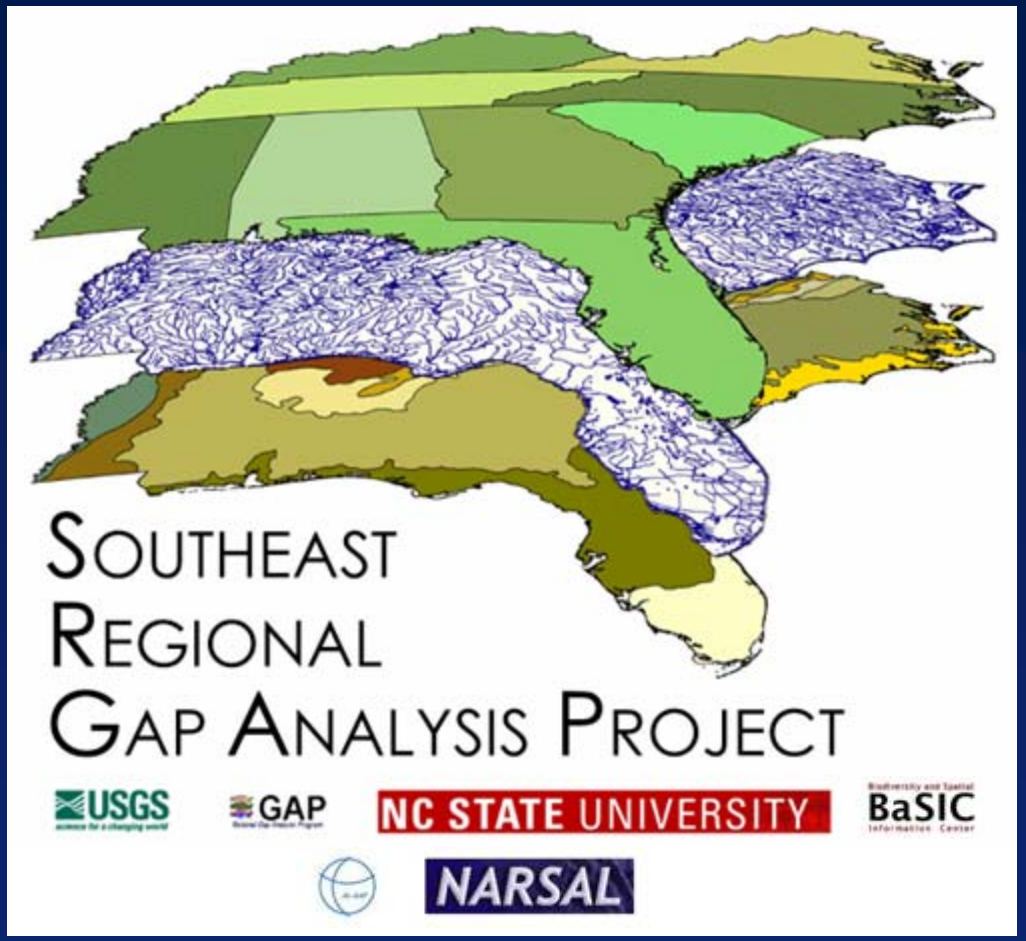

Process & Review:
SE-GAP Avian Distribution Models for the Southeast

Steve Williams[1], Matt Rubino[1] & Amy Silvano[2]
[1]Biodiversity and Spatial Information Center, NCSU
[2]Alabama GAP Project, Auburn University

9 February 2007
SE-PIF Conference
Memphis, TN

USGS gap BaSIC

Goals of GAP

- Primary goals:
  - Keep common species common by identifying conservation gaps
  - Provide information about conservation gaps and biodiversity to make informed resource management decisions
  - Facilitate application of this information to resource management activities

SE Gap Project Goals

- Create consistent and current land cover products for the Southeast
- Create consistent presence/absence models for 600+ native terrestrial vertebrates
- Incorporate GAP data with ongoing conservation planning efforts
  - ✓ North American Bird Conservation Initiative
  - ✓ USFWS Refuges, Ecological Services, and CCP Planning Process
  - ✓ State Comprehensive Wildlife Conservation Plans
  - ✓ More…

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SE-GAP's contribution to the 2001 National Land Cover Dataset

Seven mapping zones

21 Land Cover classes

Impervious Surface
(0 -100%)

Canopy Closure
(0 -100%)

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SE-GAP Land Cover Map Units

- Ecological Systems - NatureServe
  - Matrix, Large Patch, and Linear Types
  - Small patch on a case by case basis
  - ~135 systems to be mapped
- “Modifiers” to the systems
  - Where phenology or structure vary
- Additions to the NLCD Classes
  - Where useful for vertebrate modeling

SE-GAP Land Cover Dataset

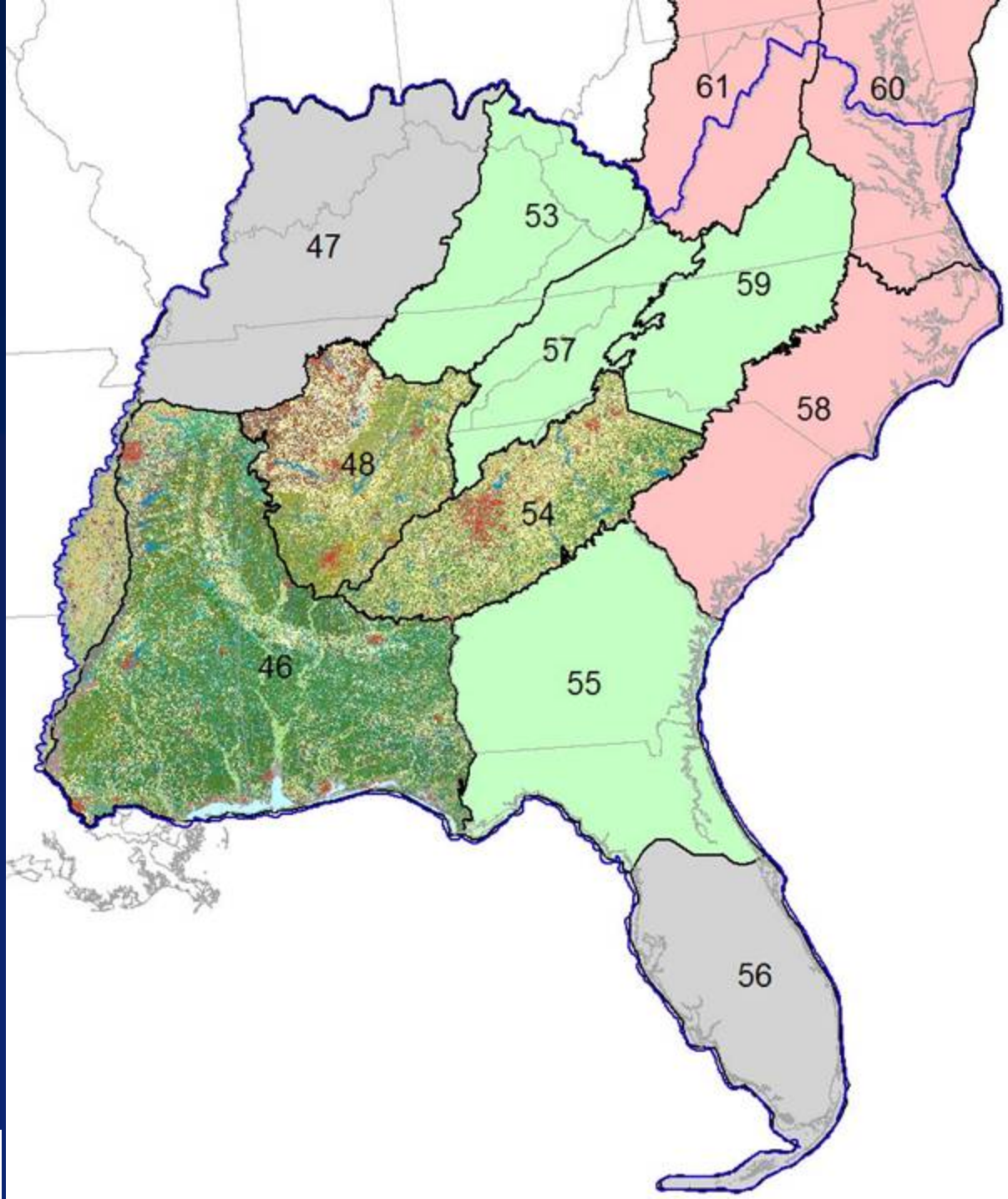
12 Map Zones

3 draft

4 review

3 ongoing

2 pending



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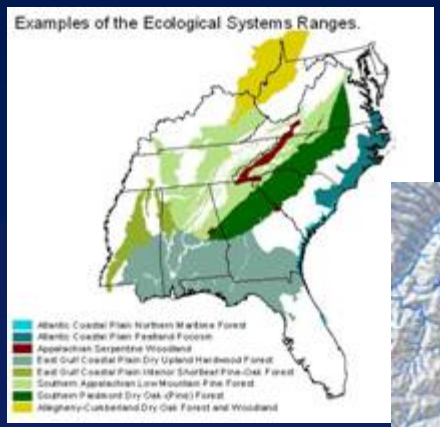
Ancillary Data Development

- Ecological System Range Maps
- Landform Modeling
- Refining NHD
- Aerial Photo Reference Data Collection
- National Wetland Inventory Data Digitization



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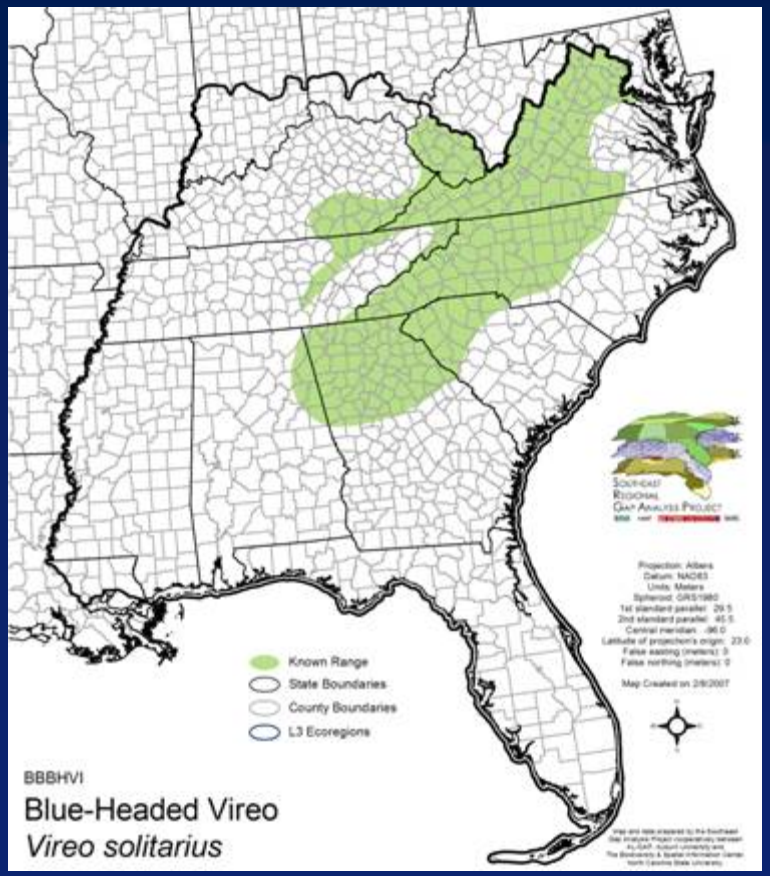
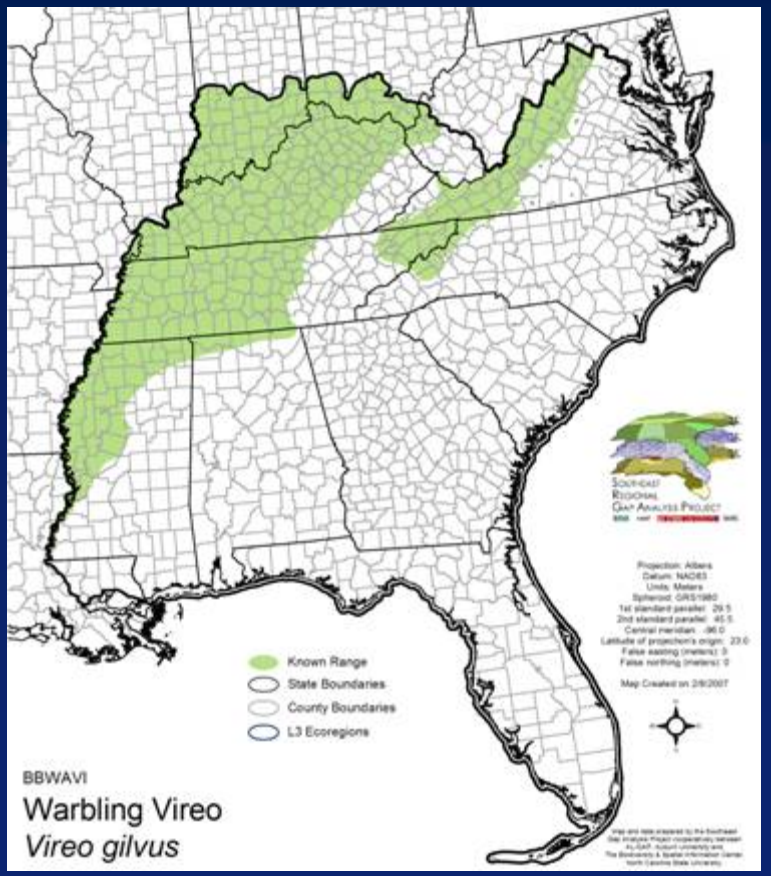
Vertebrate Data

- 608 Species (terrestrial)
  - 253 birds
- Known Range
- Predicted Habitat Models
- Presence/Absence Distribution Maps
- Knowledge Based Information

SE-GAP Known Range Maps





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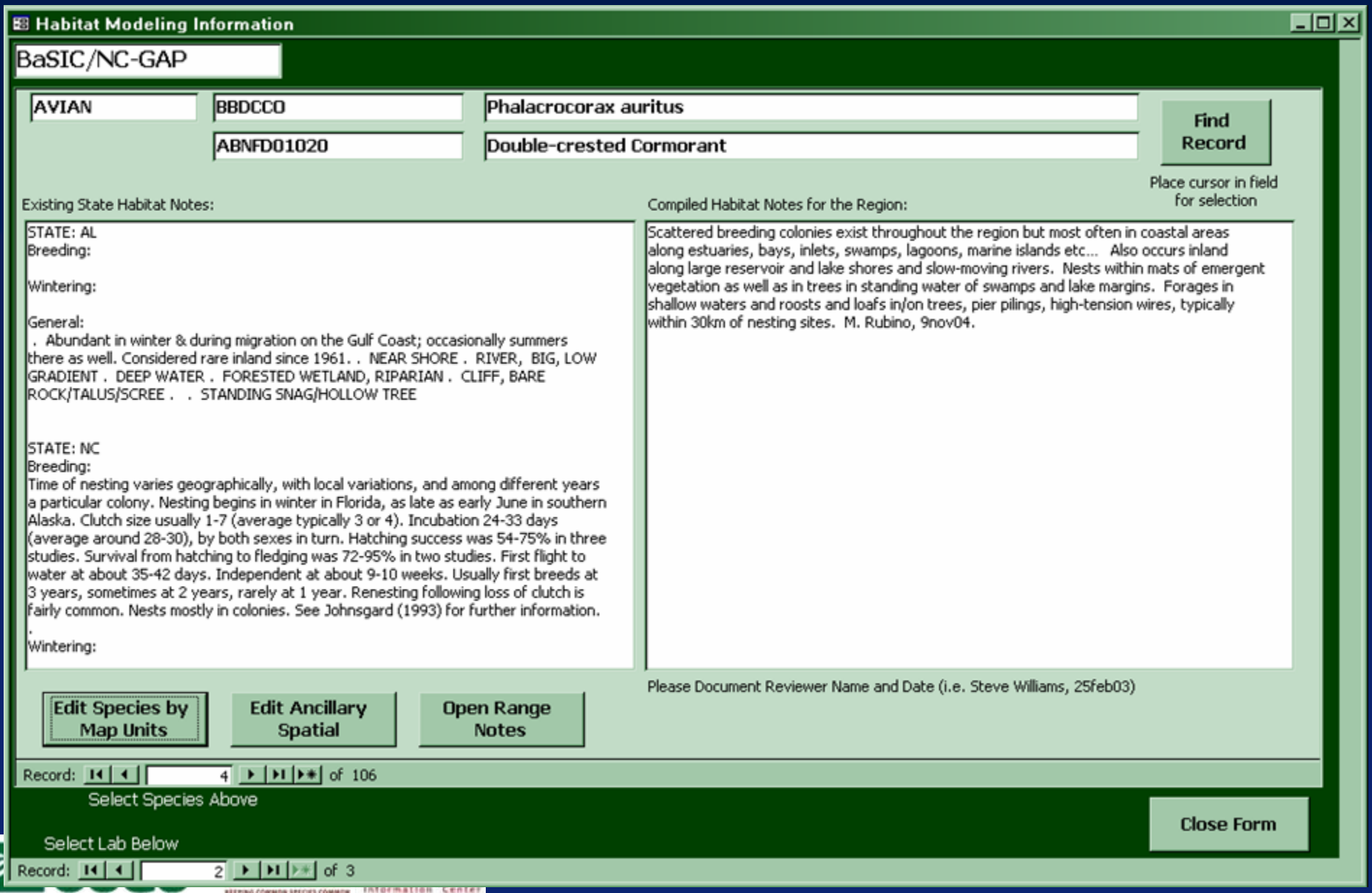
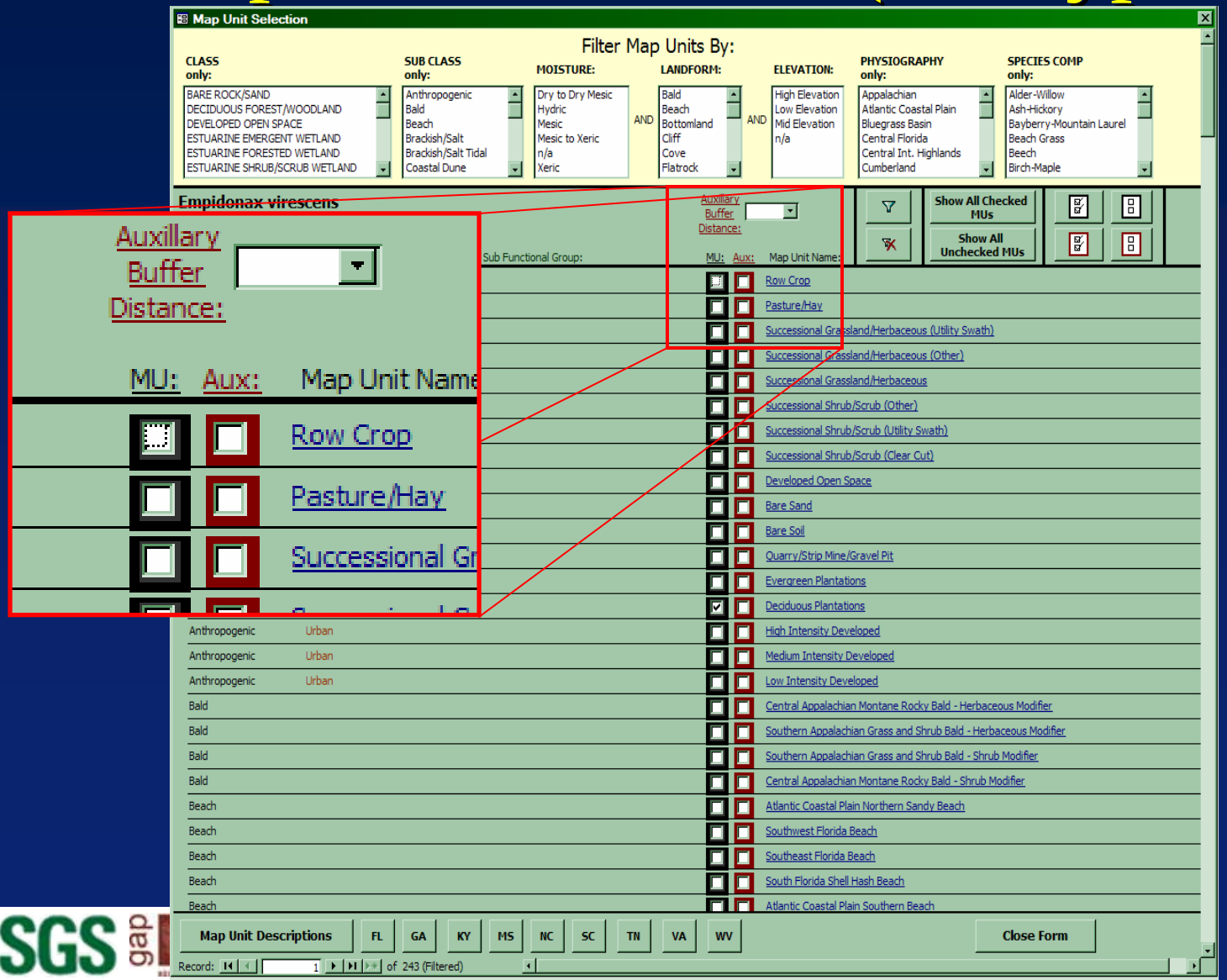
Habitat Text Review Form



Map Unit Selection (243 types)



USGS gap

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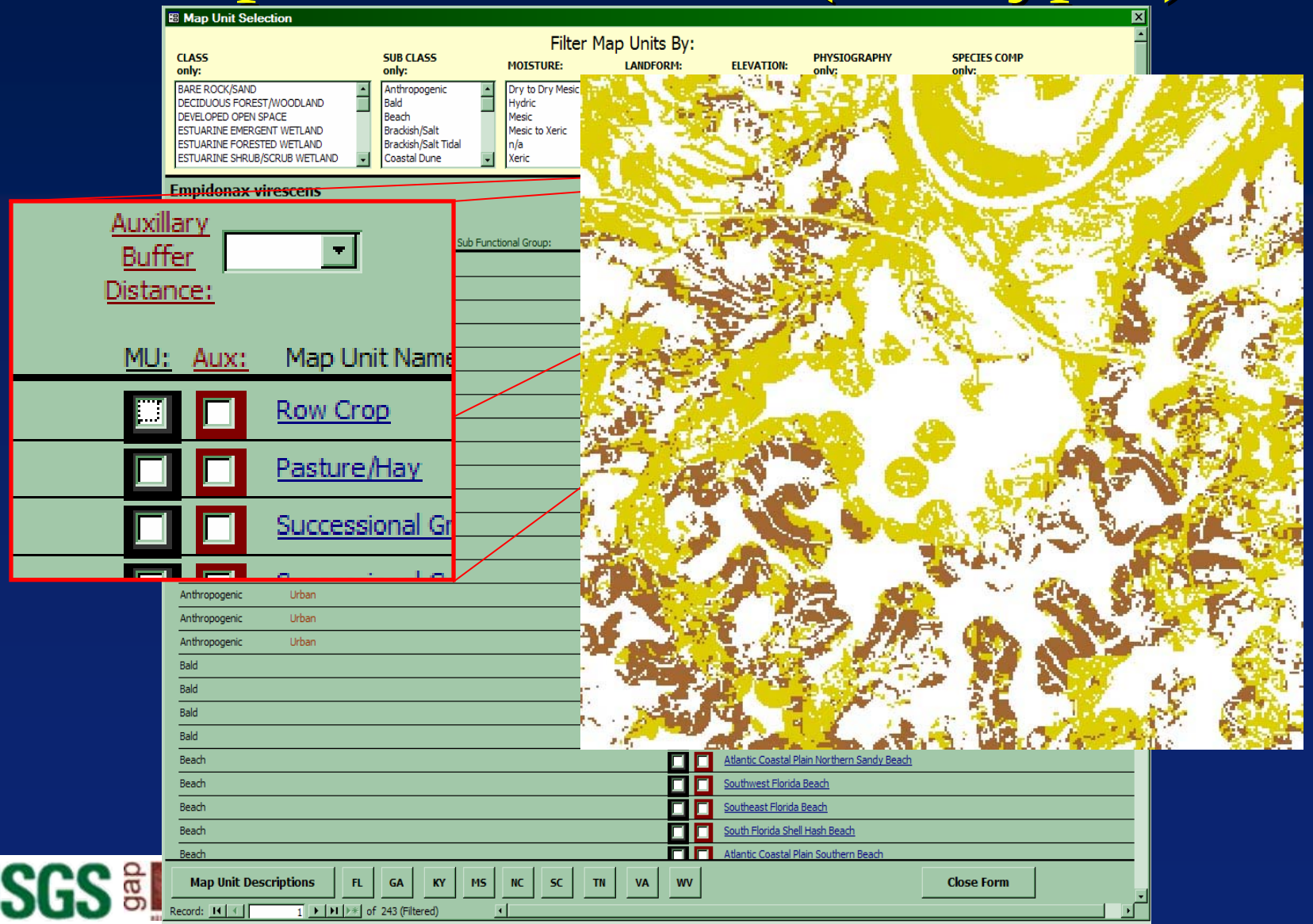
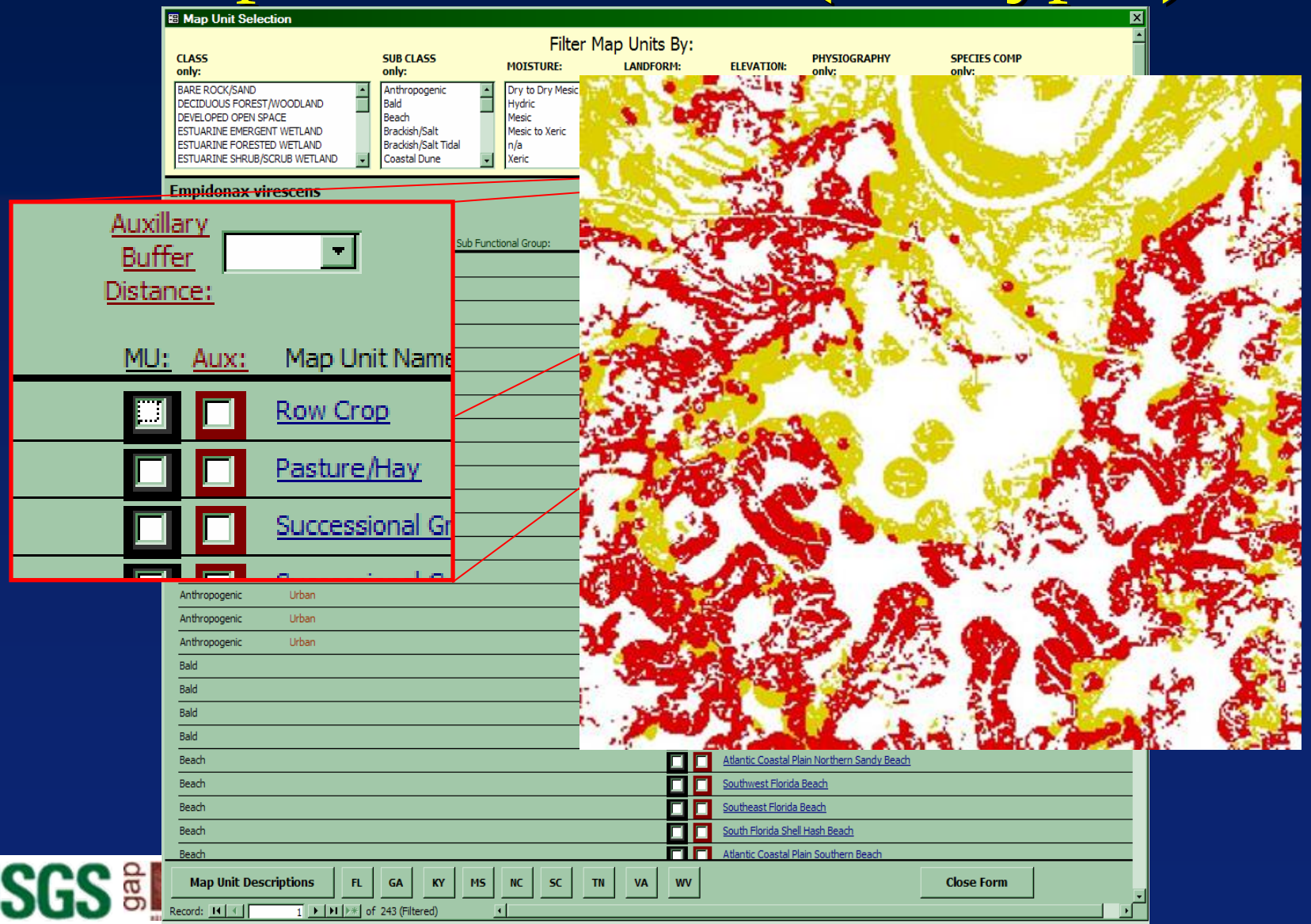
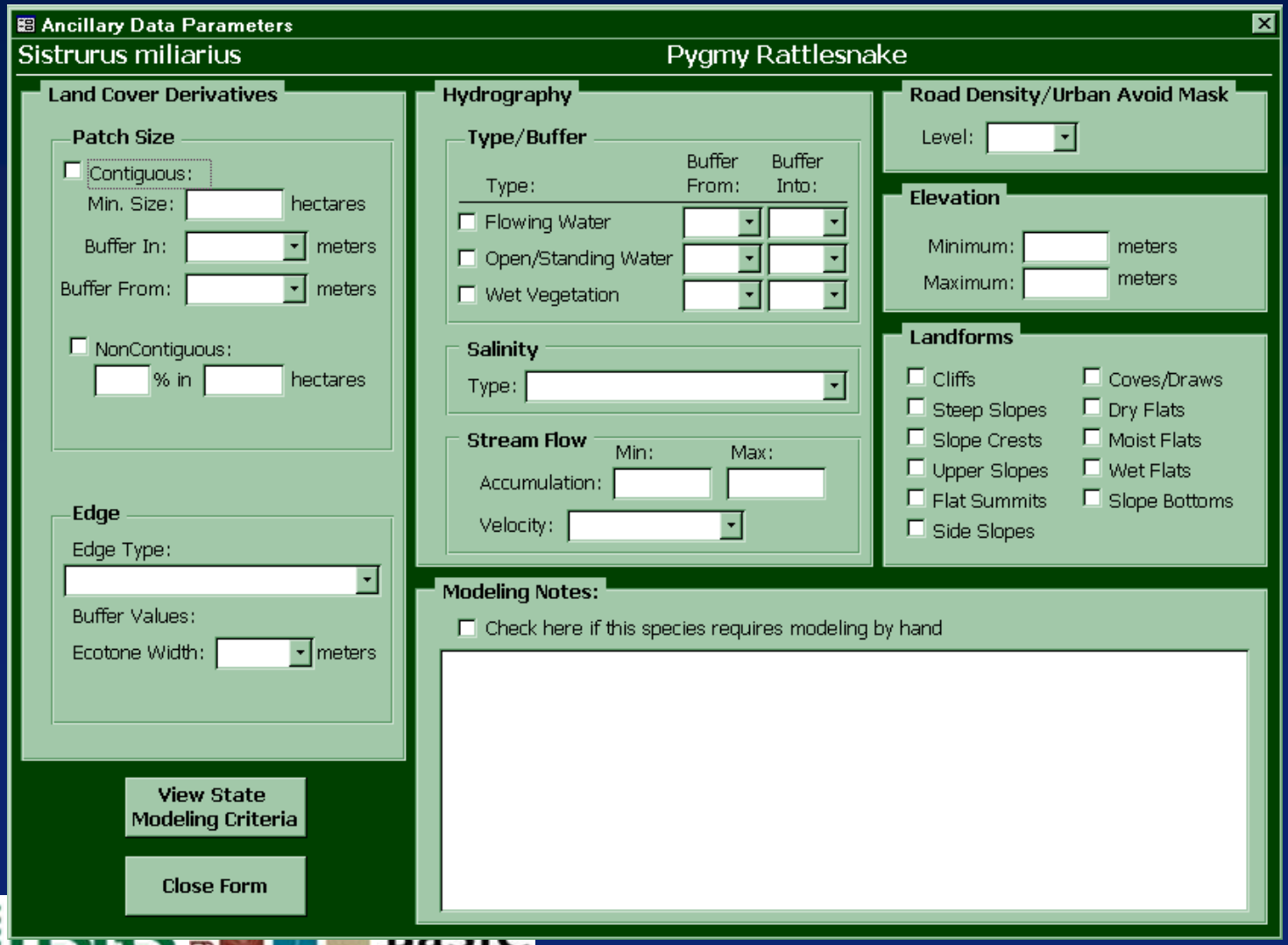


Map Unit Selection (243 types)



USGS gap

Ancillary Data Form



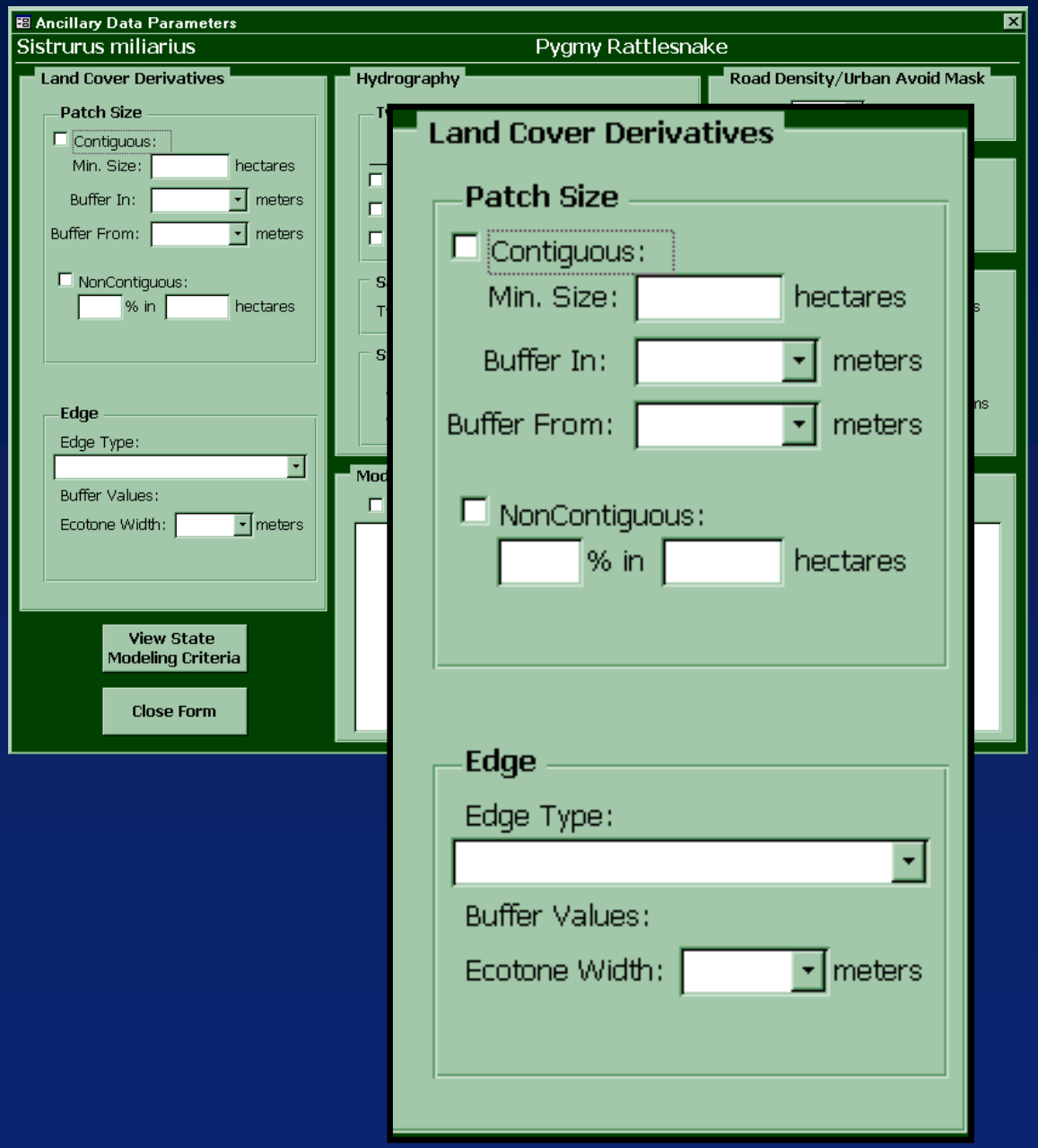
Ancillary Data Form

LAND COVER DERIVATIVES

Patch Size

Contiguous:
- Size, Buffers

NonContiguous:
- % in X area



Ancillary Data Form

LAND COVER DERIVATIVES

Patch Size

Contiguous:
Size, Buffers

NonContiguous:
% in X area

50ha minimum contiguous patch

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Ancillary Data Form

LAND COVER DERIVATIVES

Patch Size

Contiguous:
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NonContiguous:
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50ha minimum contiguous patch

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Ancillary Data Form

LAND COVER DERIVATIVES

Patch Size

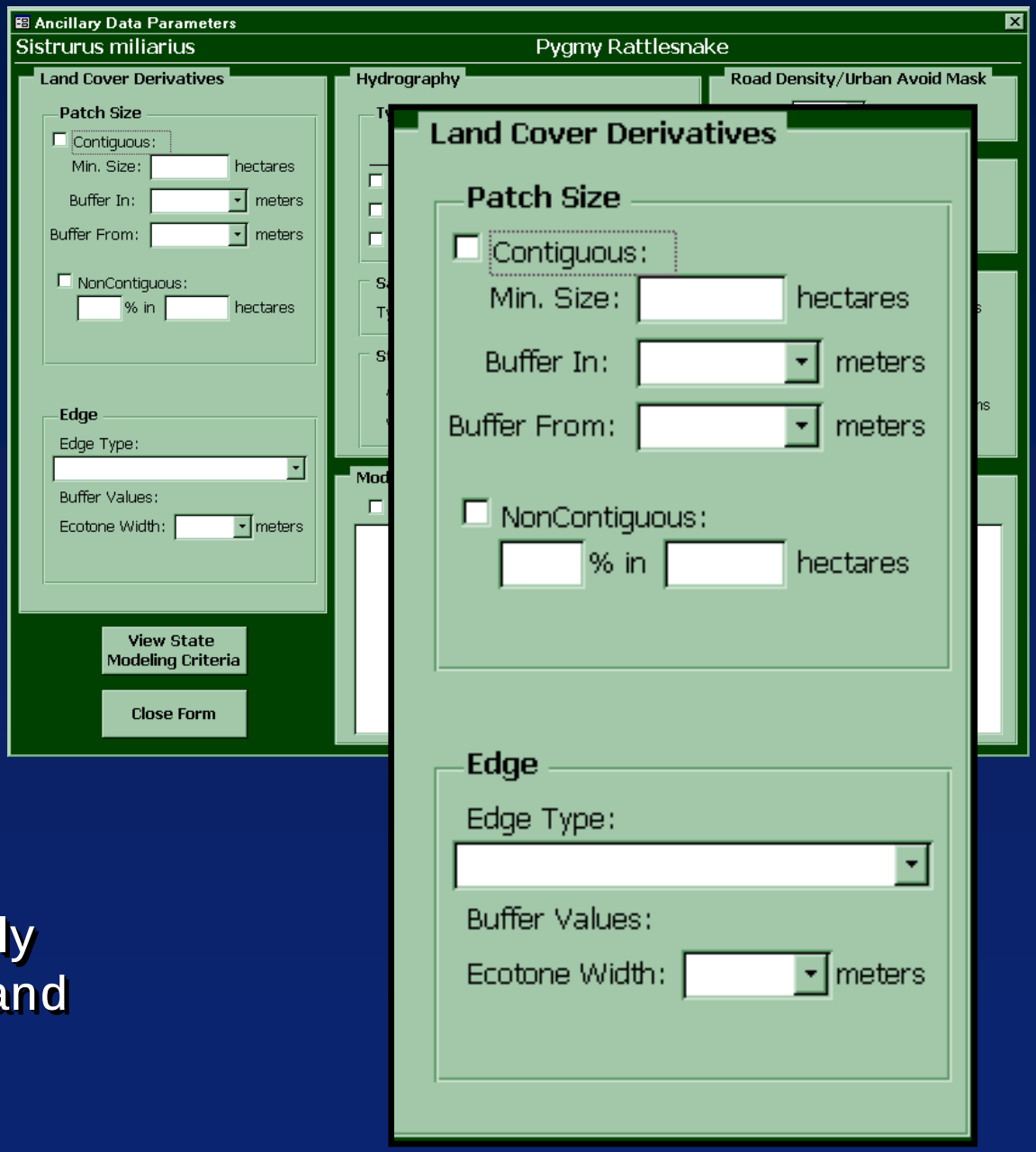
Contiguous:
- Size, Buffers

NonContiguous:
- % in X area

Edge

Edge Type:
- Forest/Open Ecotone Only
- F/O + Shrubland/Woodland

Forest Interior



Ancillary Data Form

HYDROGRAPHY

Type/Buffer

Buffer distances:

30, 60, 120, 250, 500, 1000, 2000, 4000, >4k

Salinity

Type:

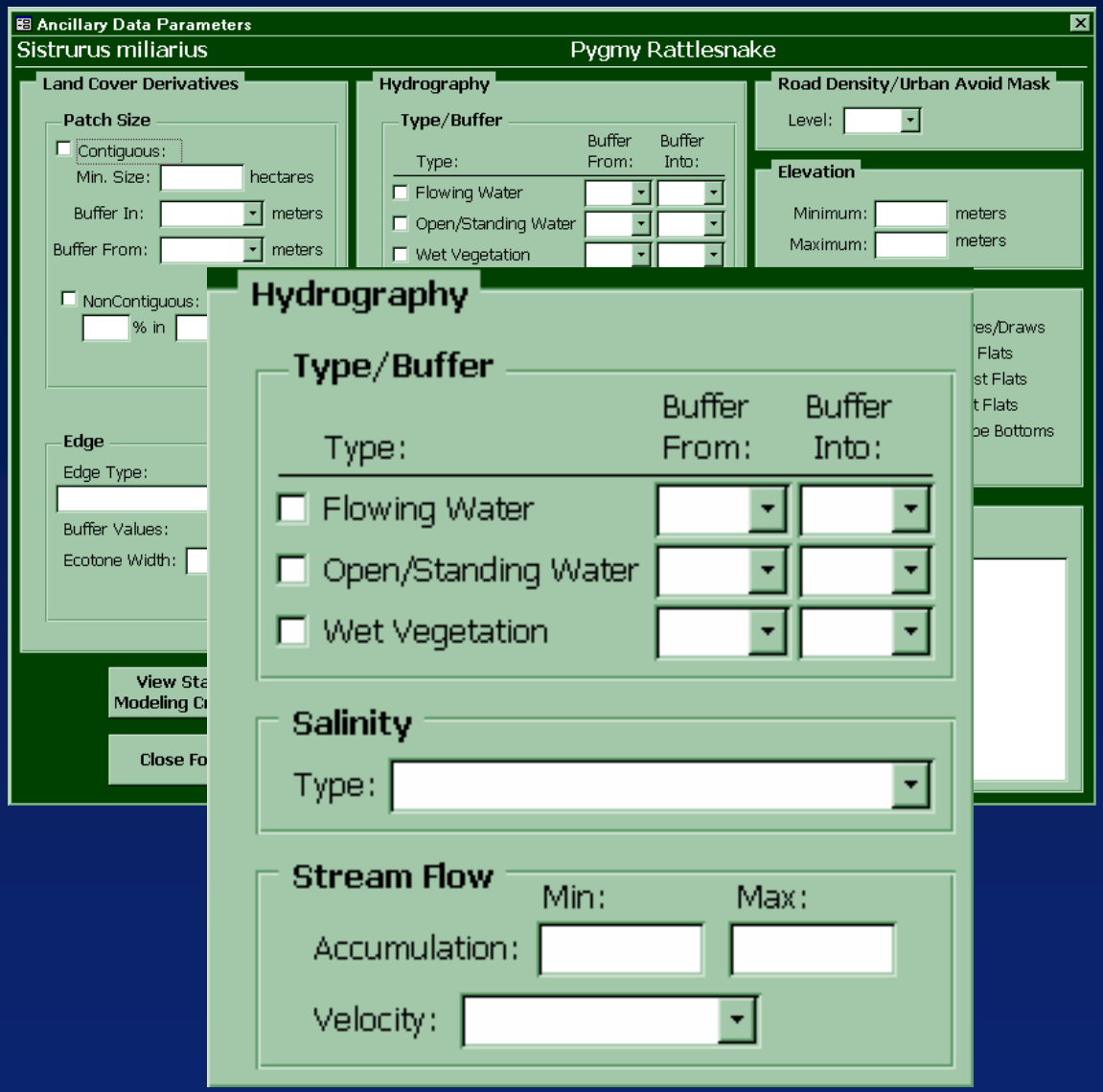
Freshwater Only

Brackish/Saltwater Only

Stream Flow

Velocity:

Fast Only, Slow Only



Ancillary Data Form

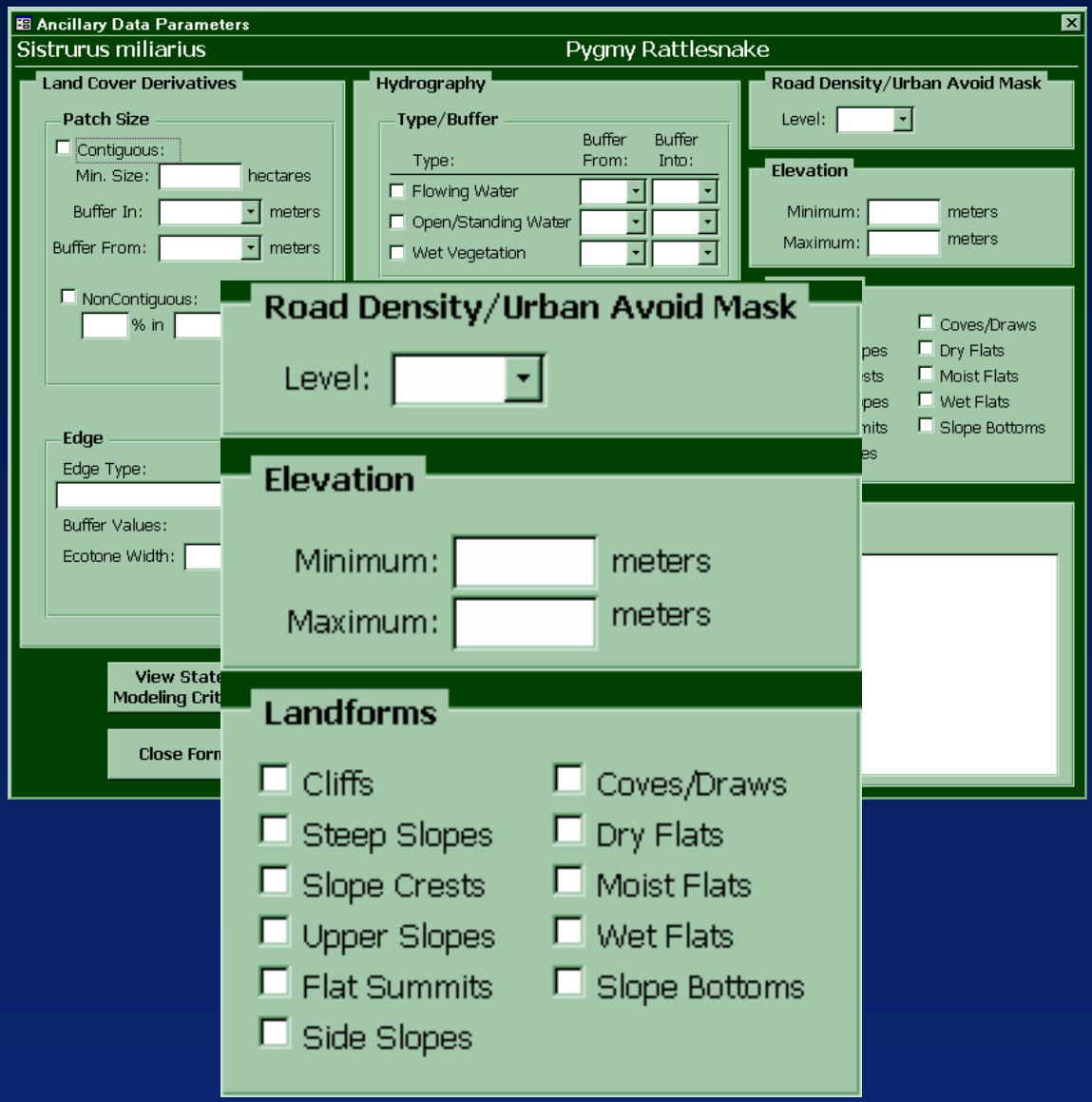
ROAD DENSITY / URBAN AVOID MASK

Level:

Low, Medium, High

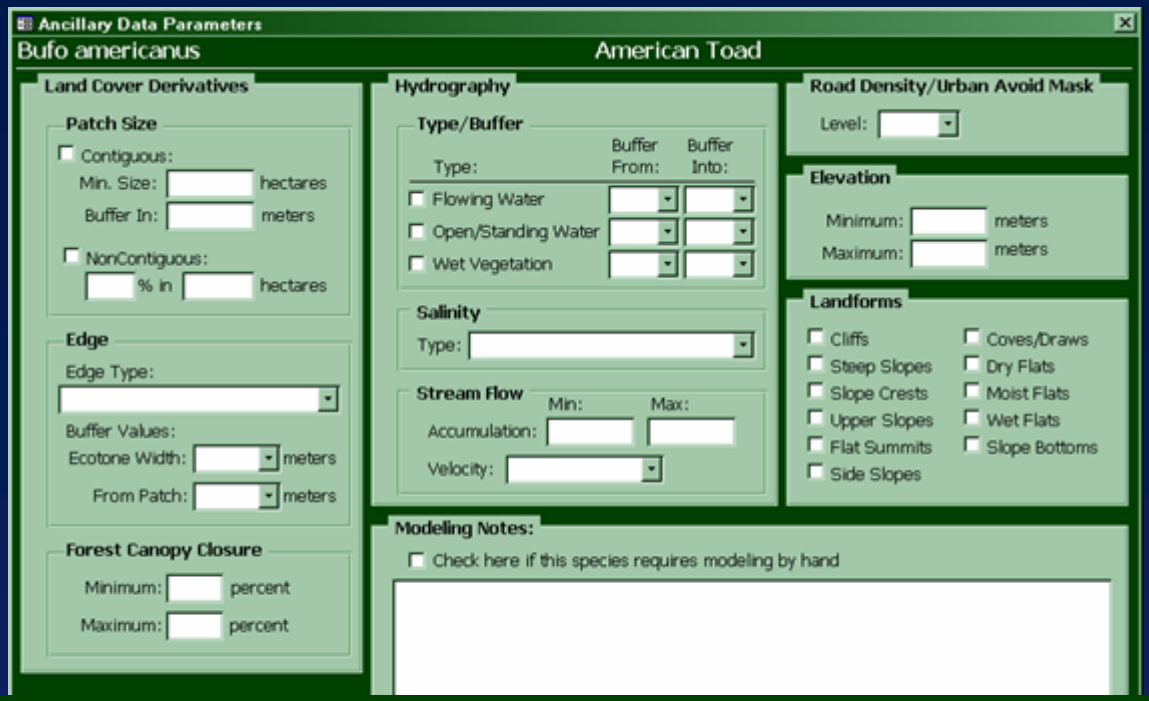
ELEVATION

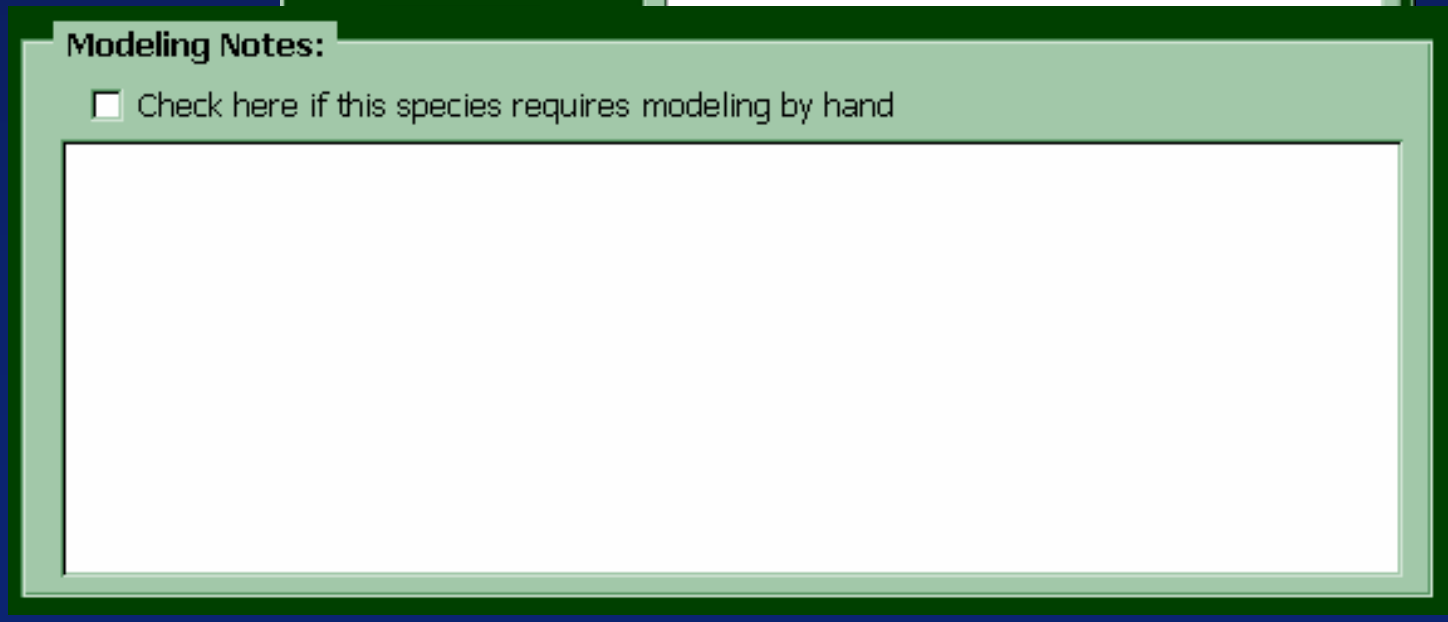
LANDFORMS



Ancillary Data Form

MODELING NOTES





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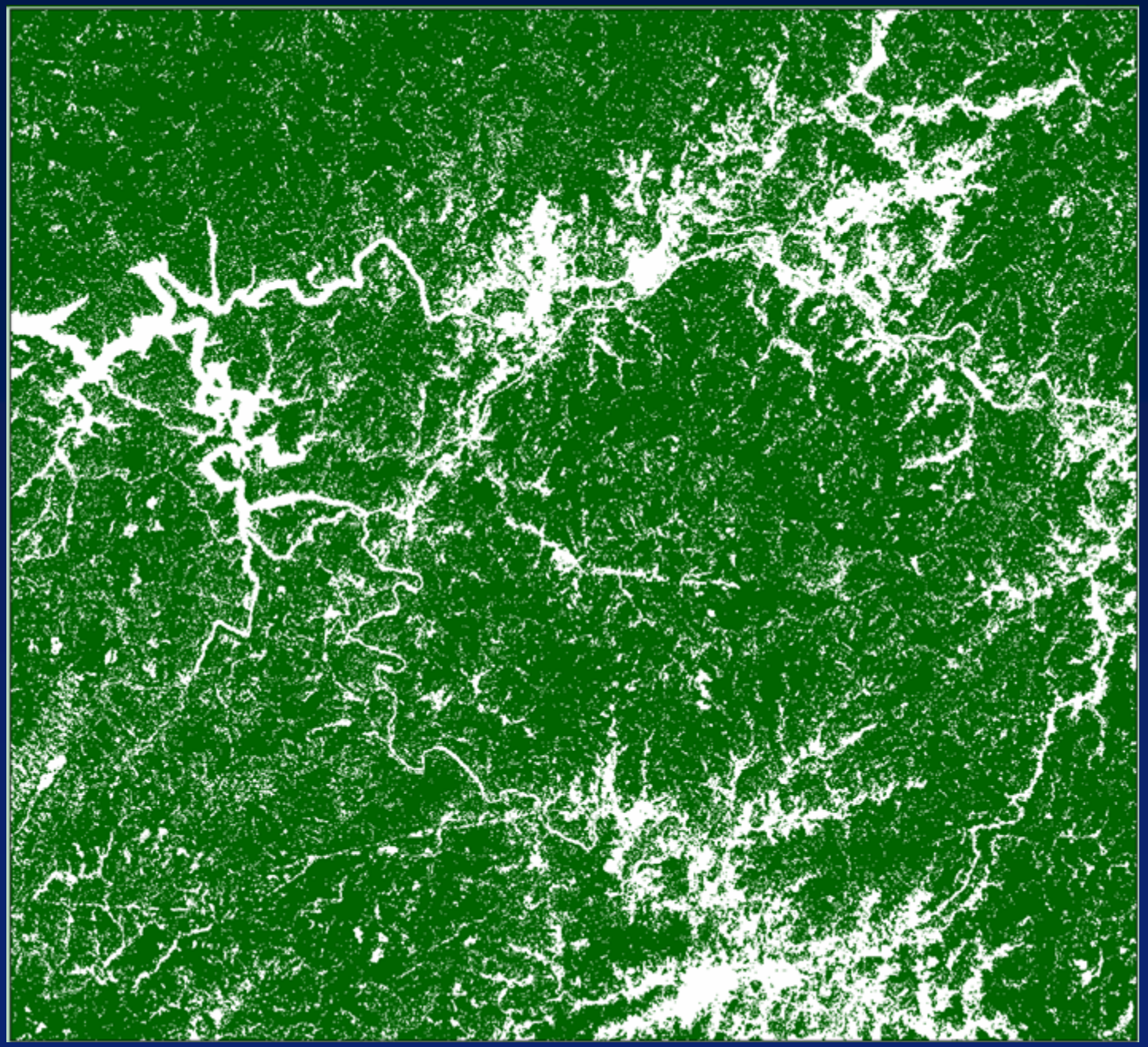
Acadian Flycatcher *Epidonax virescens*

Appropriate Vegetation (forested map units)



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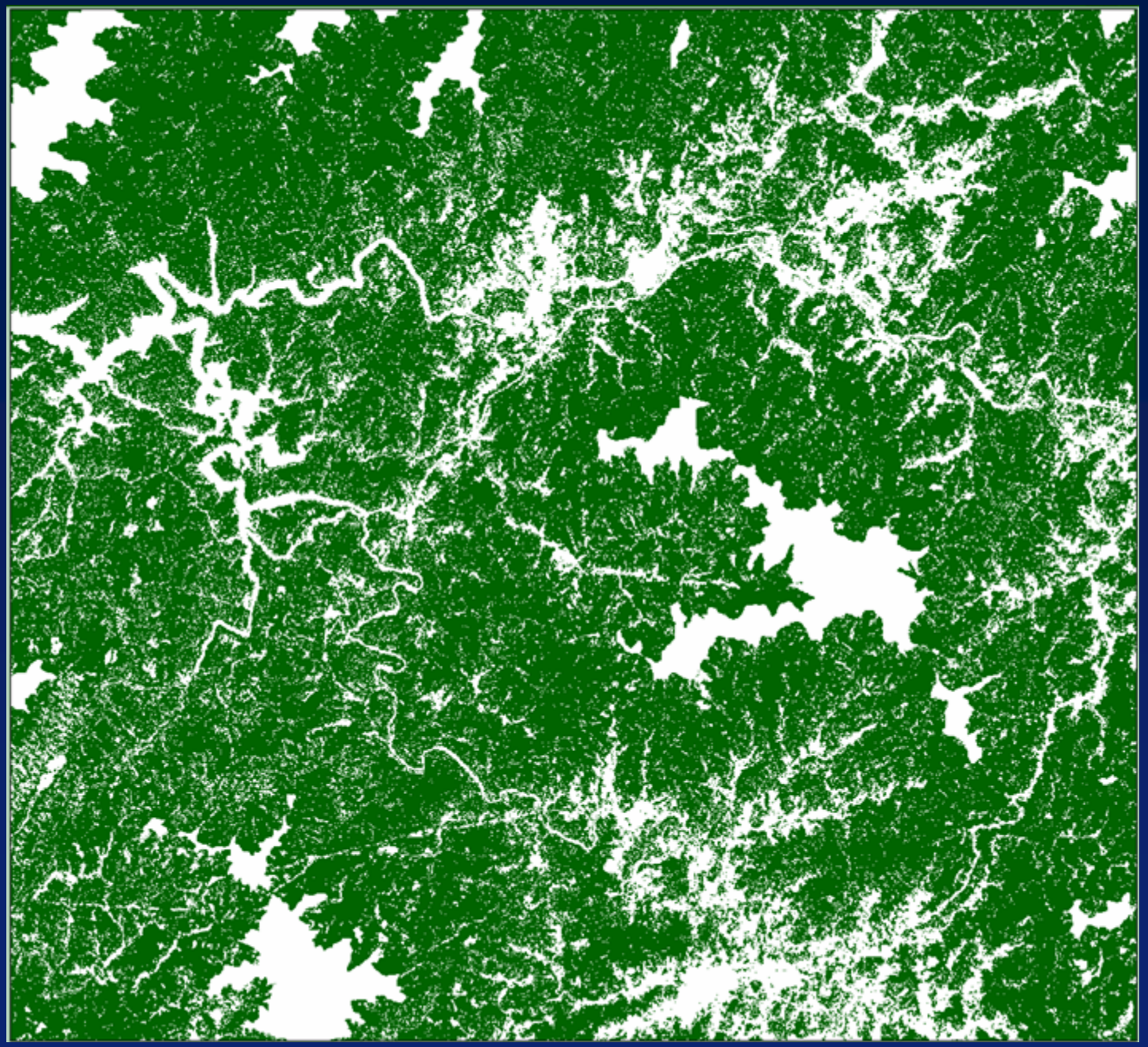
Acadian Flycatcher
Epidonax virescens

Appropriate Vegetation (forested map units)

Elevation Mask (< 4000')



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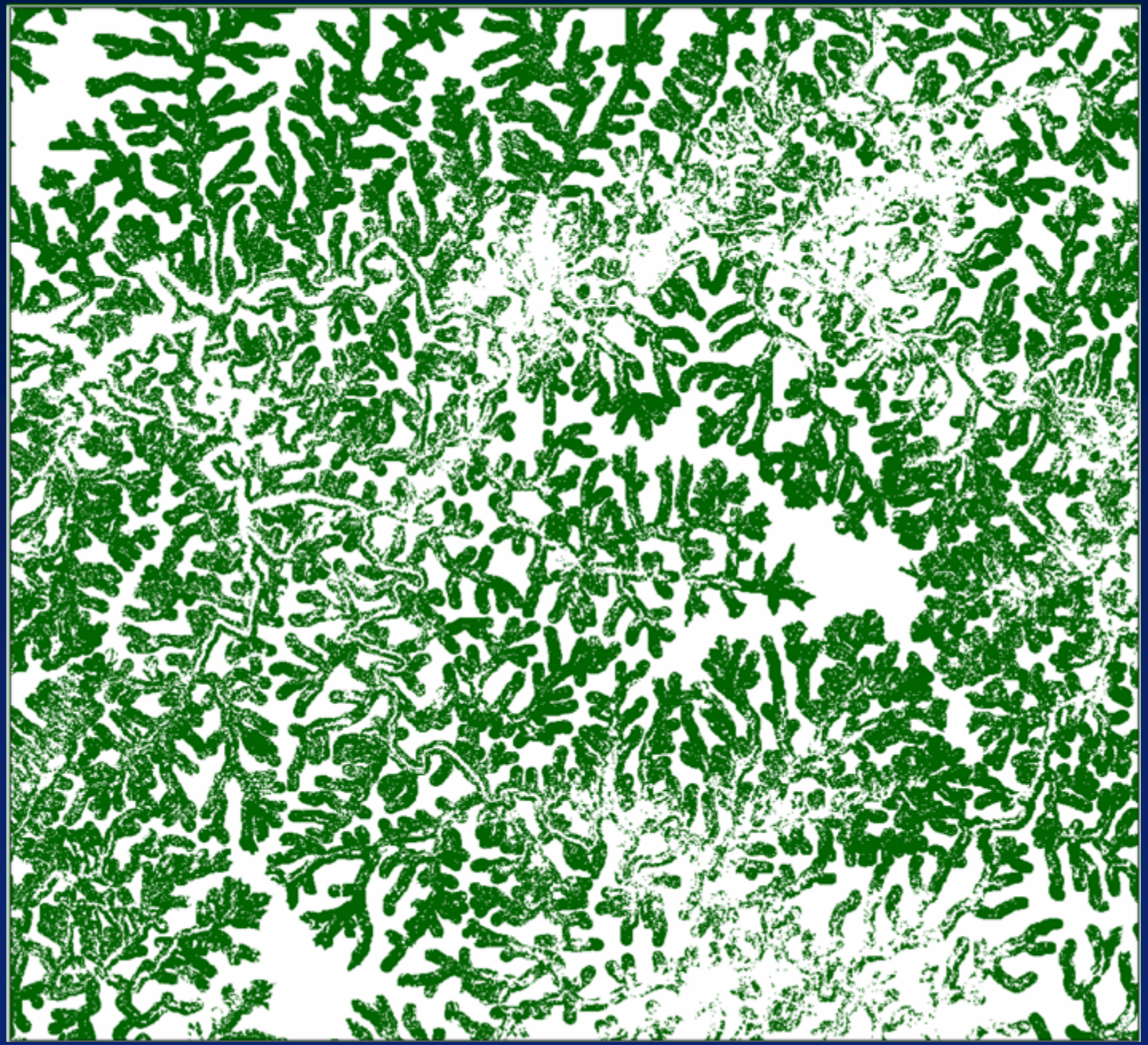
Acadian Flycatcher
Epidonax virescens

Appropriate Vegetation (forested map units)

Elevation Mask (< 4000')

Proximity to Water Mask (< 200m)



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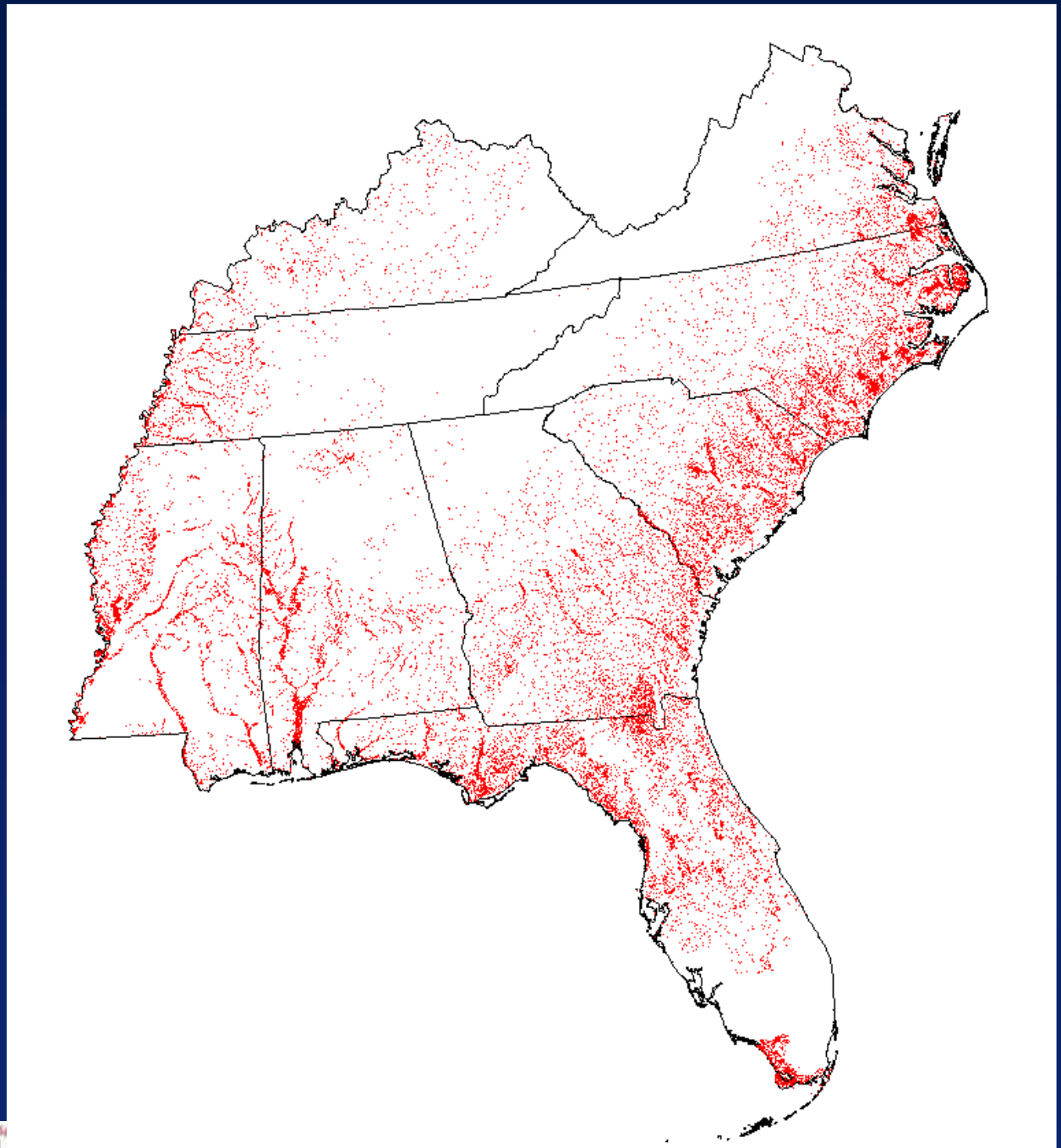
SE-GAP Pres./Abs. Distribution Model



Prothonotary Warbler
Protonotaria citrea

SE-GAP Deliverables

- 2001 NLCD level land cover (20 classes)
- 2001 GAP level land cover based on NatureServe Systems (135+ classes)
- Digital photo library (30,000+)
- Ancillary data sets (NHD, NED, NWI, landform) used in spatial modeling
- Vertebrate database
  - ✓ Taxonomic information
  - ✓ Protection status
  - ✓ Habitat relationships
  - ✓ Textual descriptions of habitat
  - ✓ Spatial modeling criteria
  - ✓ Citations
- 600+ vertebrate species known range maps and distribution models (presence/absence)

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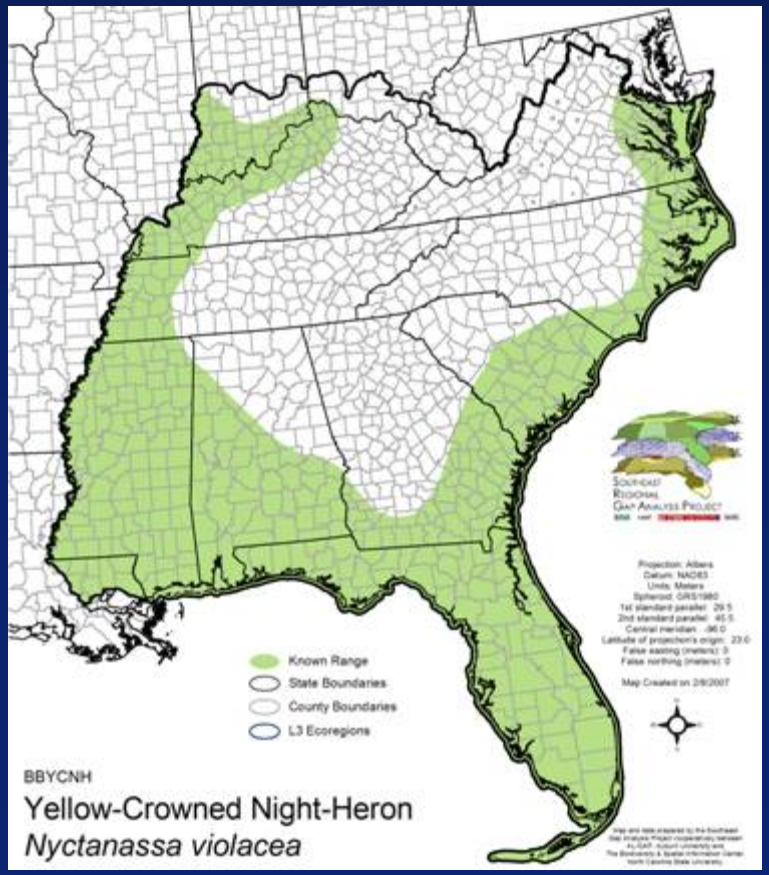
Model Assessment

- Assessment of modeling done with comparing species lists of management areas with model output to produce Omission and Commission rates.
- Reviewer Agreement with model.
  - Need to keep it relatively simple and concise.
  - Assess major components models and overall model performance.

Reviewer Agreement with Model

1. The light green shaded area is an accurate representation of the known range extent of this species.



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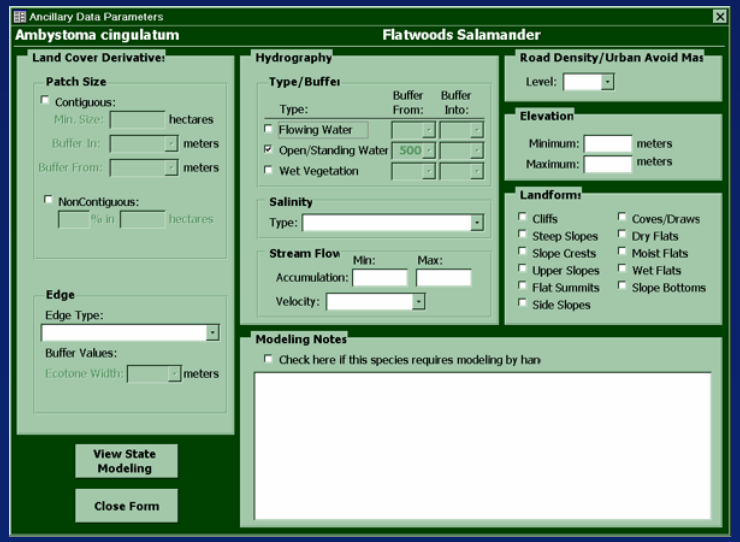
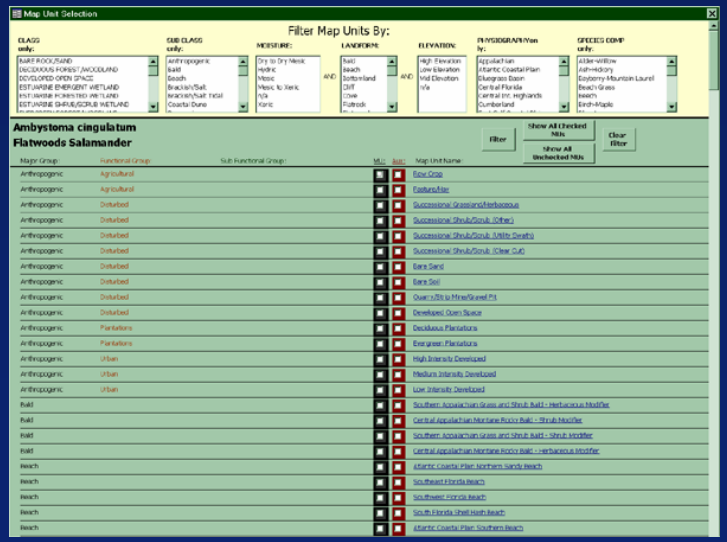
Reviewer Agreement with Model

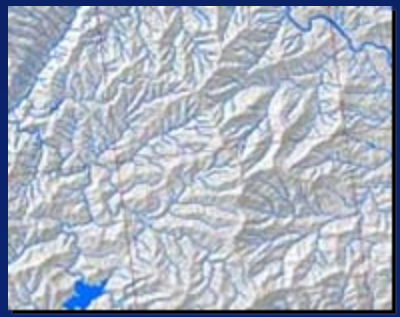
1. The light green shaded area is an accurate representation of the known range extent of this species.
2. The parameters used to model the predicted distribution of this species accurately represent its habitat requirements in the southeastern United States.





Reviewer Agreement with Model

1. The light green shaded area is an accurate representation of the known range extent of this species.
2. The parameters used to model the predicted distribution of this species accurately represent its habitat requirements in the southeastern United States.
3. The spatial data adequately represent the species' habitat requirements.

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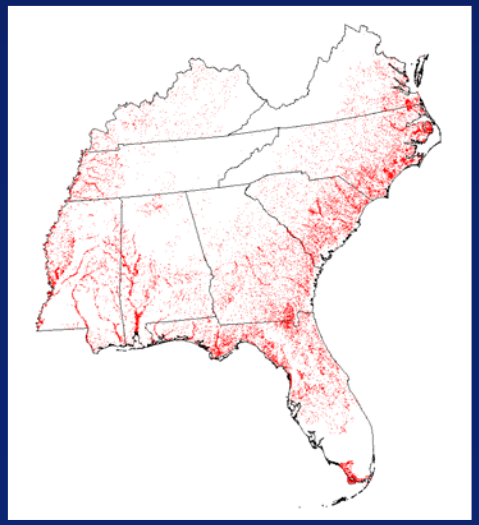
2. The parameters used to model the predicted distribution of this species accurately represent its habitat requirements in the southeastern United States.
3. The spatial data adequately represent the species' habitat requirements.
4. The red pixels on the map adequately represent the distribution of this species' habitat within the identified range extent.



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Reviewer Agreement with Model

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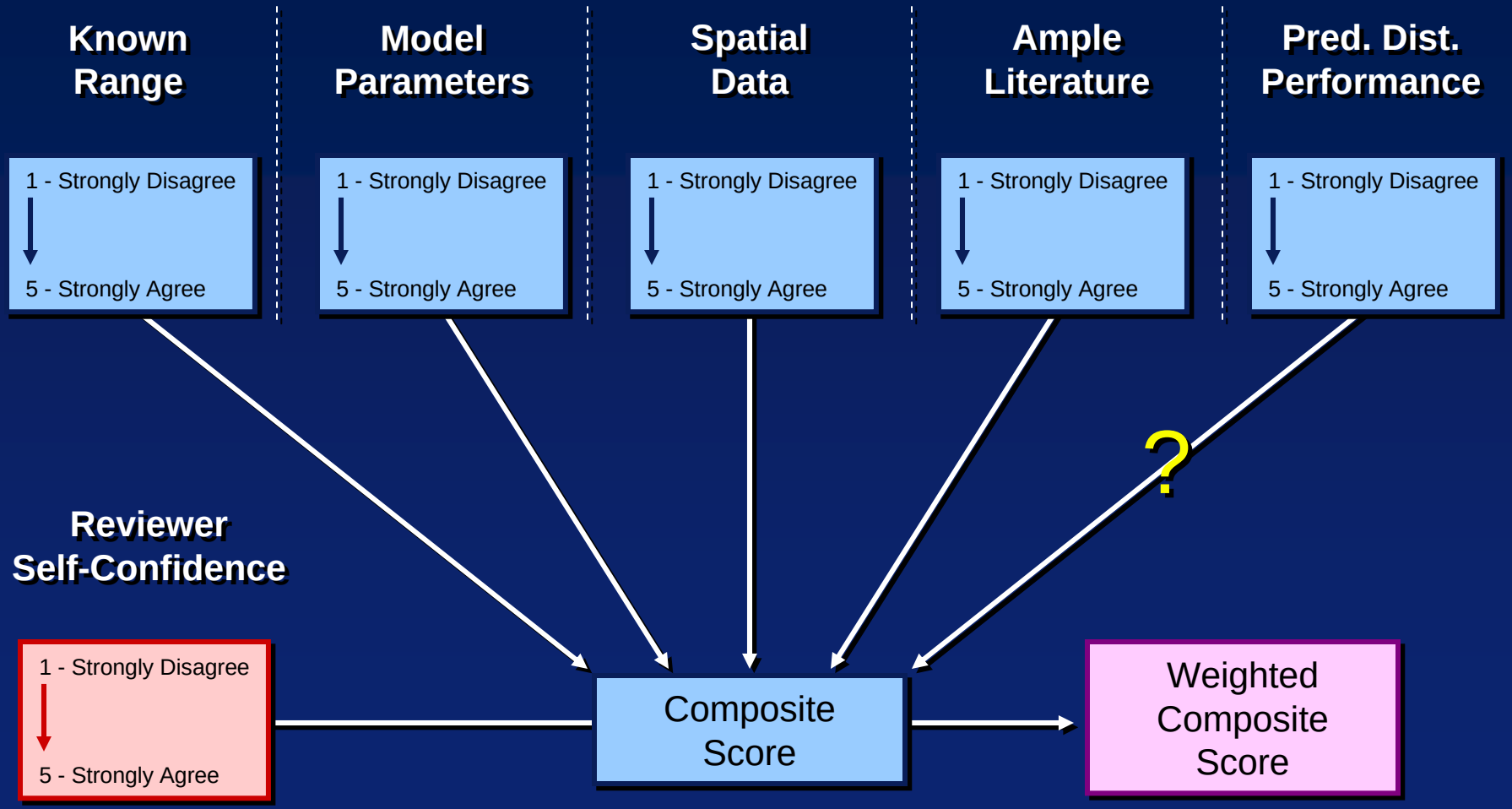
3. The spatial data adequately represent the species' habitat requirements.
4. The red pixels on the map adequately represent the distribution of this species' habitat within the identified range extent.
5. The published literature adequately documents the breeding habitat requirements for this species in the southeastern United States.

Reviewer Agreement with Model

1. The light green shaded area is an accurate representation of the known range extent of this species.
2. The parameters used to model the predicted distribution of this species accurately represent its habitat requirements in the southeastern United States.
3. The spatial data adequately represent the species' habitat requirements.
4. The red pixels on the map adequately represent the distribution of this species' habitat within the identified range extent.
5. The published literature adequately documents the breeding habitat requirements for this species in the southeastern United States.
6. I am an expert in the natural history of this species.

Baysian Belief Network



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National Gap Analysis Conference 2007

Featuring the Southeast Regional Gap Analysis Project
(Kentucky, Tennessee, Alabama, Georgia, Florida, South Carolina, North Carolina, and Virginia)

gap
KEEPING COMMON SPECIES COMMON

SOUTHEAST
GAP ANALYSIS PROJECT

USGS
science for a changing world

http://gapanalysis.nbii.gov

Call for Special Sessions, Papers and Posters

Abstracts due: March 1st

September 10 – 13, 2007
Renaissance Asheville Hotel
Asheville, North Carolina