

The importance of forest management to landscape-scale bird conservation across private and public forestlands



Jeff Larkin

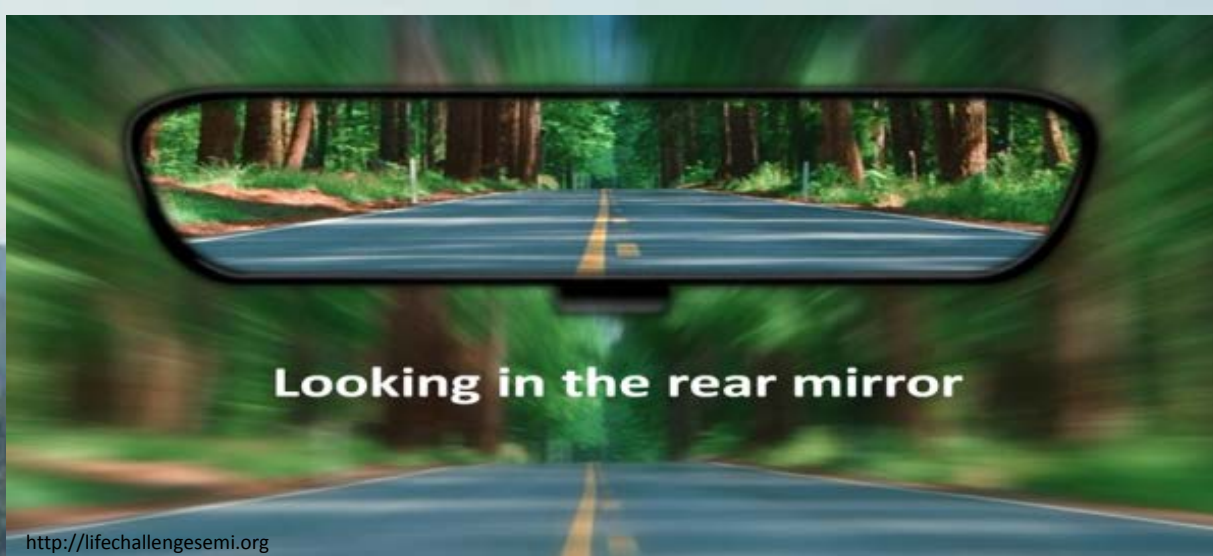
- *Professor of Wildlife Ecology and Conservation at Indiana University of PA*
- *Natural Resource Conservation Service-WLFW- GWWA Science Advisor*
- *American Bird Conservancy's - Eastern Forest Habitat Coordinator*



Goals

- 1) Highlight why forest wildlife need forest managers and that the win-win concept between these two areas is stronger than ever.
- 2) Convey that sound forest management at the appropriate spatial scale is critical to integrating wildlife and forest management. This effort need not be viewed as single-species conservation, wildlife-centric, or forestry-centric!
- 3) Briefly discuss challenges of implementation on public and private forest lands.
- 4) Stress the need to maintain a science & monitoring component to help evaluate and enhance the integration of wildlife conservation and forest management. (Both forest response and wildlife response).
- 5) There is huge potential/need for scaling this effort up to implement at **BIOLOGICALLY** meaningful scales!





SUCCESS



WHAT PEOPLE THINK
IT LOOKS LIKE

Story line: First there was Curiosity,
then Concern, then Chaos, then
Cooperation, and then Conservation
happened! (D. Roos, 2016)

Correction Factor



SUCCESS

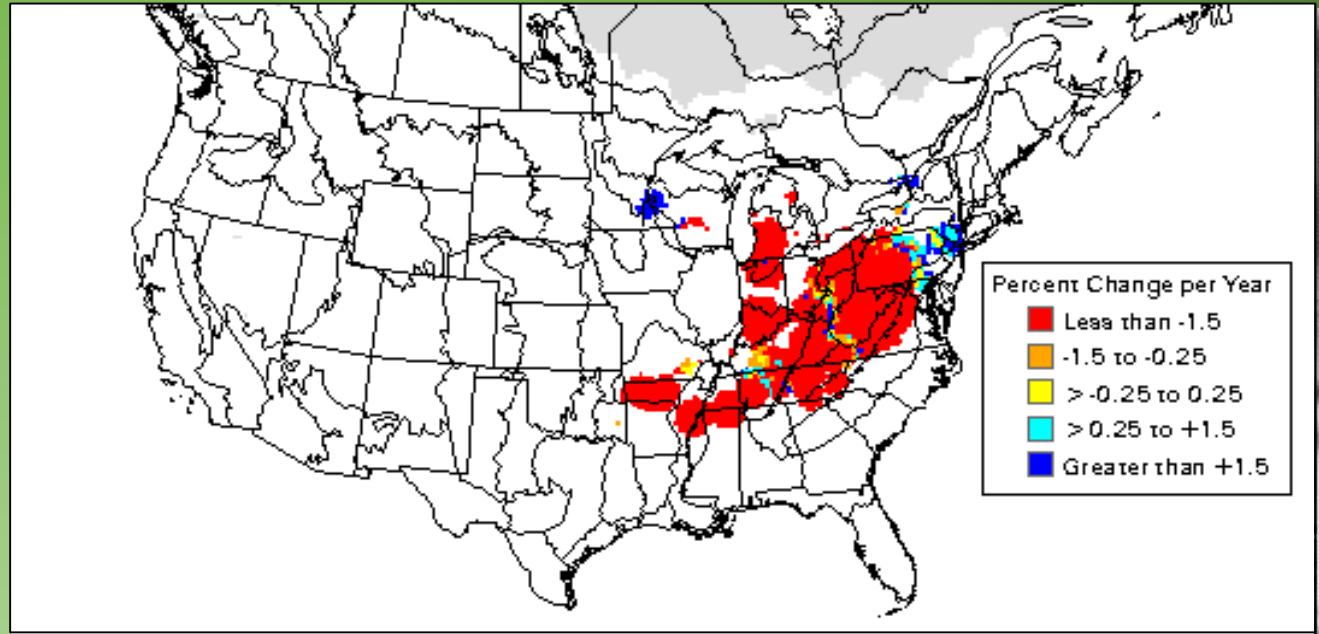


WHAT IT REALLY
LOOKS LIKE

Once Upon a Time...

For as long as humans have formally studied birds, investigators have attempted to unravel the many mysteries of bird ecology.

- At first, these studies were largely driven by a desire for naturalists and ecologists to simply quench their own curiosities
- Those curiosities evolved into efforts to develop methodologies to consistently monitor bird populations over time. As annual population data began to accumulate, many of these same passionate researchers and their prodigies became concerned with declining trends.



Ecology & Conservation of Neotropical Migratory Songbirds

- “Forest birds” is one of the primary guilds of eastern birds of which many member species are declining
 - “Early successional” or “mature” forests
 - “Coniferous”, “Mixed” or “deciduous” forest
 - “Riparian” or “upland” forests
 - “Ground”, “mid-story”, “cavity”, or “canopy” nester



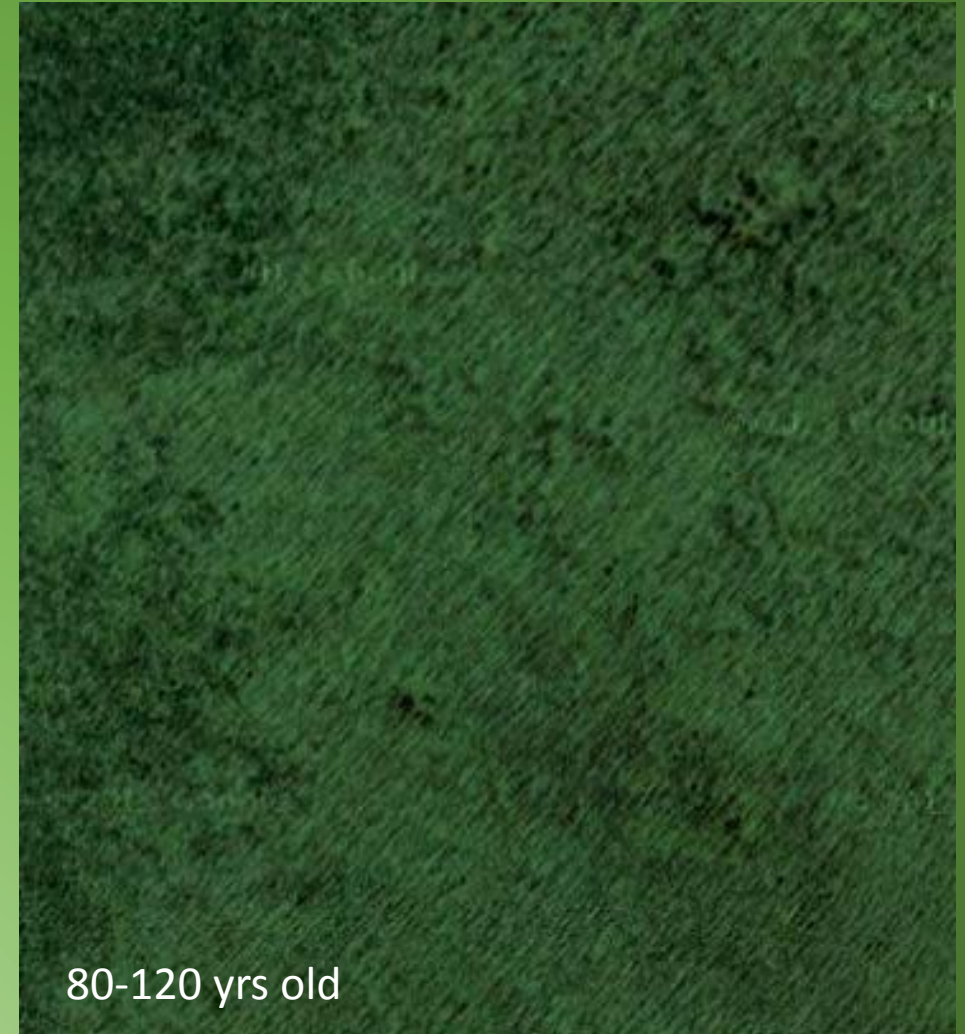
Why are Forest Birds in Trouble?

- Many of our forests are too simple.....and now we (and many forest-dependent wildlife are paying for it)
- In one massive sweep, we lost thousands of years of structural diversity in the making!



Breeding Habitat Loss

- Reduction in expansive forested landscapes
- Unbalanced forest age classes in forest that remain = **inadequate structure**

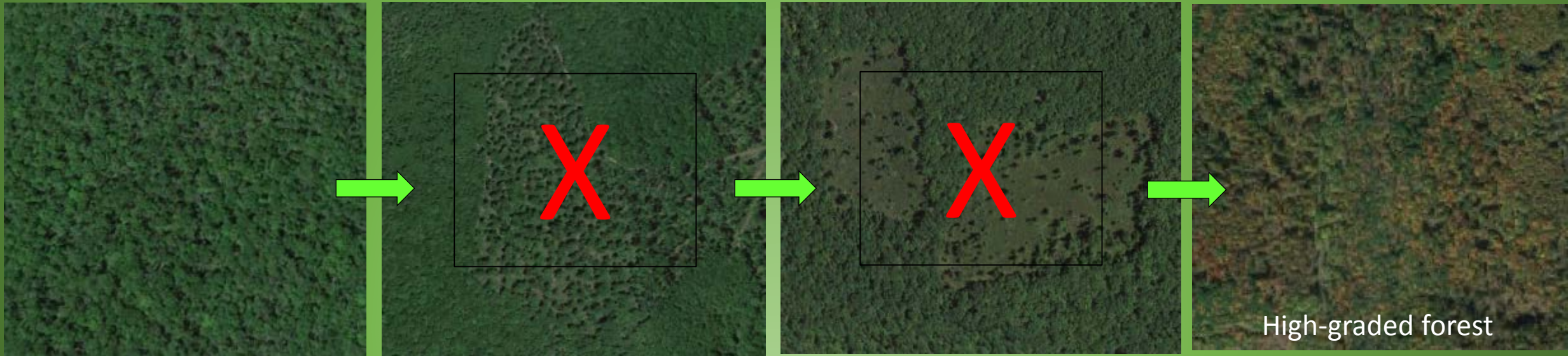


Changes in Forest Management / Harvest Practices

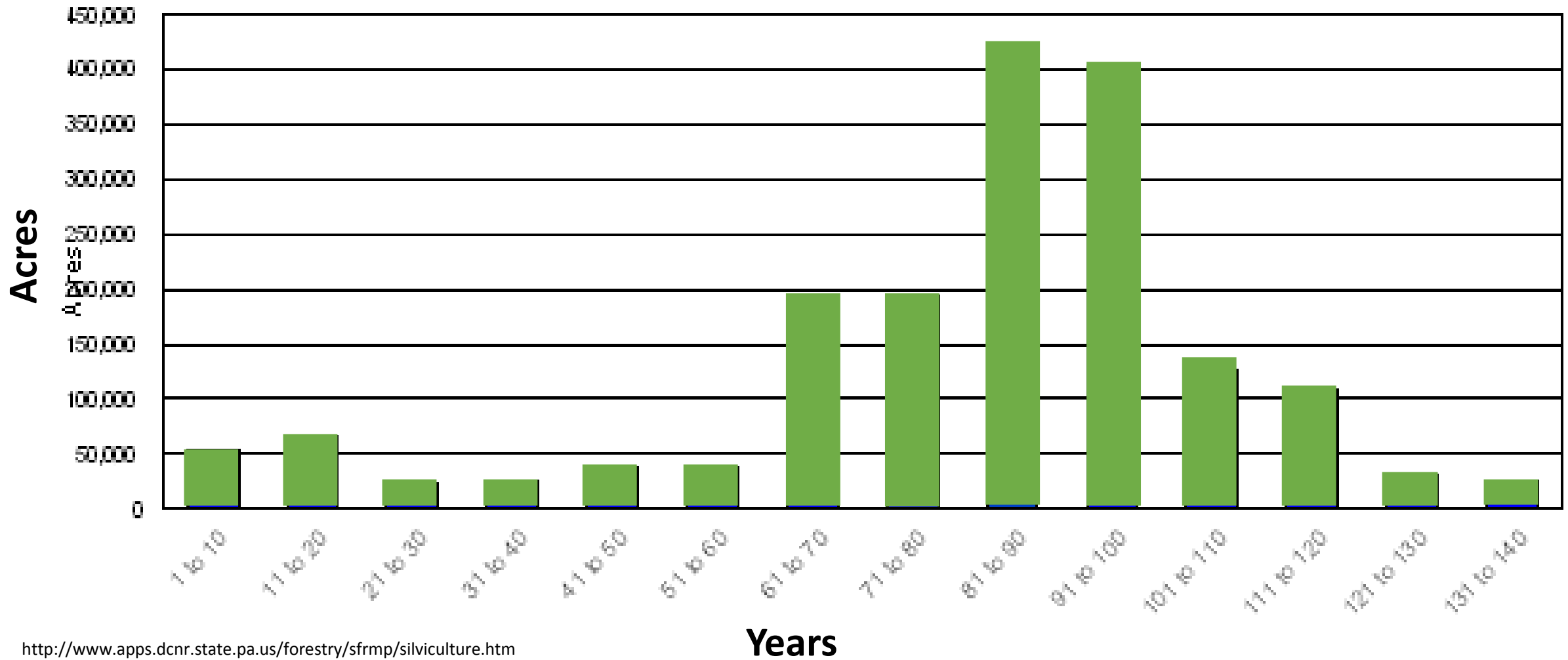
Previously



Currently



Forest Age Class Distribution



Avian conservation science has resulted in a plethora of seemingly never-ending:

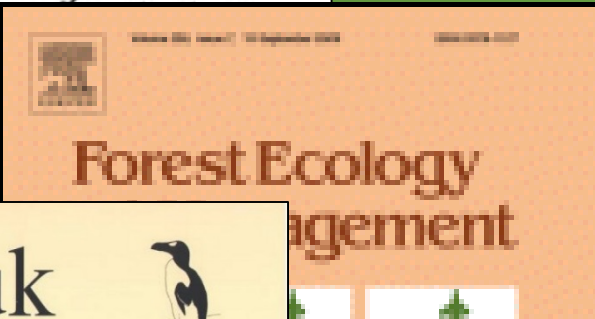
Research articles

Books that synthesize research into applied information.

Conservation Plans.....lots of plans!

The Wilson Journal

of
Volum

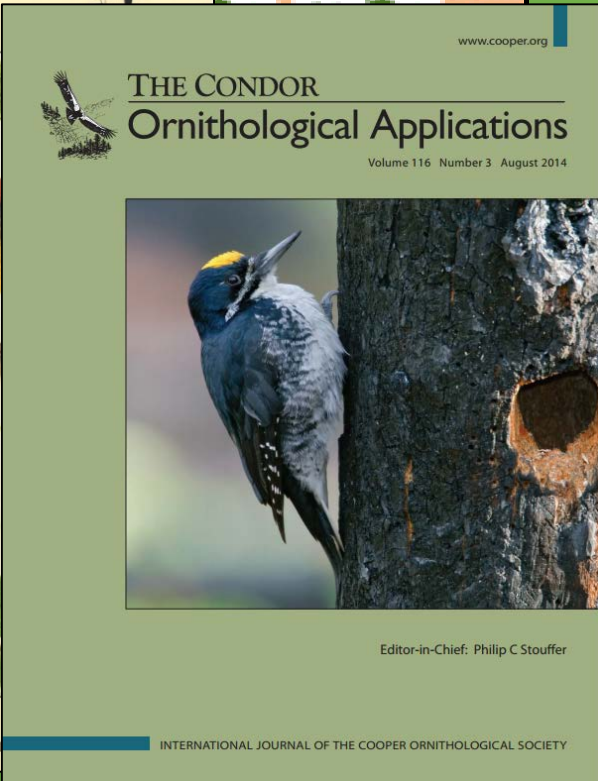


The Auk

Vol. 118 No. 2 April 2001



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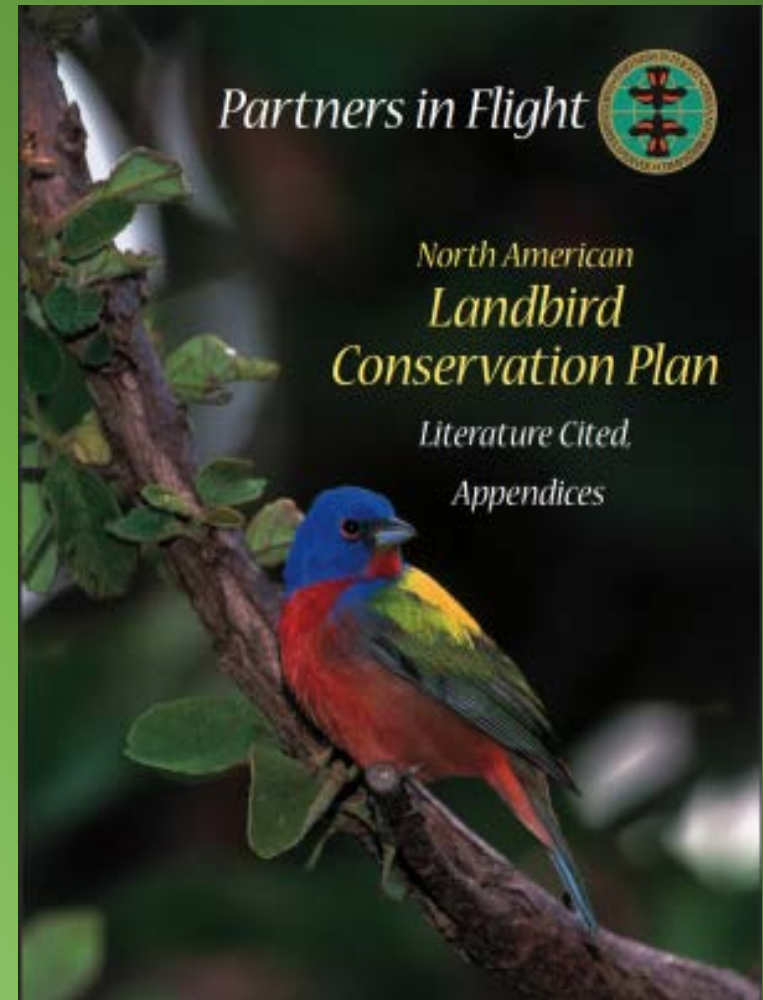
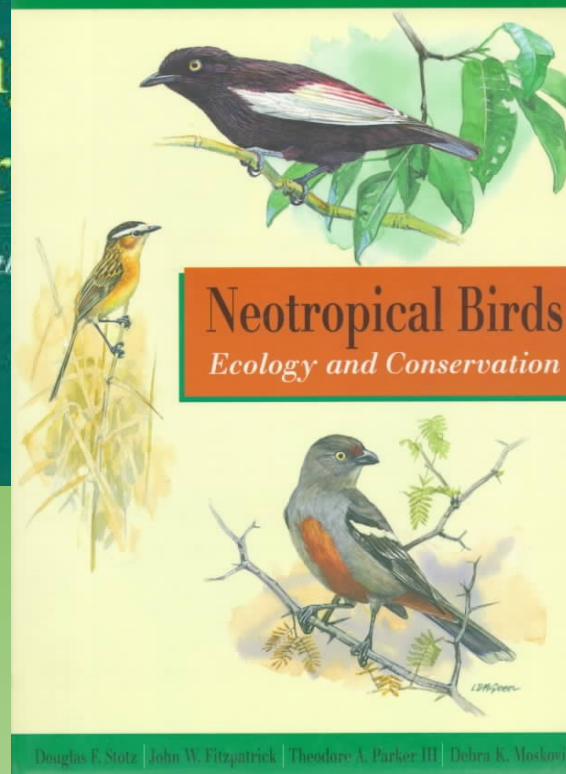
Editor-in-Chief: Philip C. Stouffer

INTERNATIONAL JOURNAL OF THE COOPER ORNITHOLOGICAL SOCIETY

Ecology and Management of Neotropical

Migrant Birds

A Synthesis



Variation of the same theme...



Collectively, there exists substantial evidence that suggests forest bird conservation **regardless of nesting guild and life cycle phase** (nesting, post-fledging, pre-migration) is **intimately** tied to:

- 1) landscape context (i.e., stand age class interspersion)
- 2) within-stand structural complexity

POSTFLEDGING DISPERSAL, HABITAT USE, AND HOME-RANGE SIZE OF JUVENILE WOOD THRUSHES (The Auk) 1 of many!

“Habitats used after dispersal differed from natal habitats” (Anders et al. 1998).

“Our data suggest that in large tracts of mature deciduous forest, a mosaic of early and mid-successional forest stands, along with mature riparian forest, will accommodate both the breeding and post-dispersal habitat requirements of Wood Thrushes and other Neotropical migratory birds.”



Landscape configuration effects on distribution and abundance of Whip-poor-wills (Wilson Journal of Ornithology)

“Forest management for Whip-poor-wills should consider harvest strategies that maintain the availability of regenerating patches in close proximity to mature forests.” (Wilson and Watts 2008).



Studies have “recently” examined nesting and post-fledging habitat selection of many at-risk, forest-dependent songbirds.

Fiss et al. in prep





Noticing, many species working groups have created to collate much of this science into
 species management and the list

*A Land Manager's Guide to
 Improving Habitat for
 Forest Thrushes*

*Ecology and Management of
 Appalachian
 Ruffed Grouse*

DEANNE STAL
 Editor

CERULEAN WARBLER
 Management Guidelines
 for Enhancing Breeding Habitat
 in Appalachian Hardwood Forests

**American
 Woodcock
 Habitat**
 Best Management
 Practices for
 the Central
 Appalachian
 Mountains
 Region

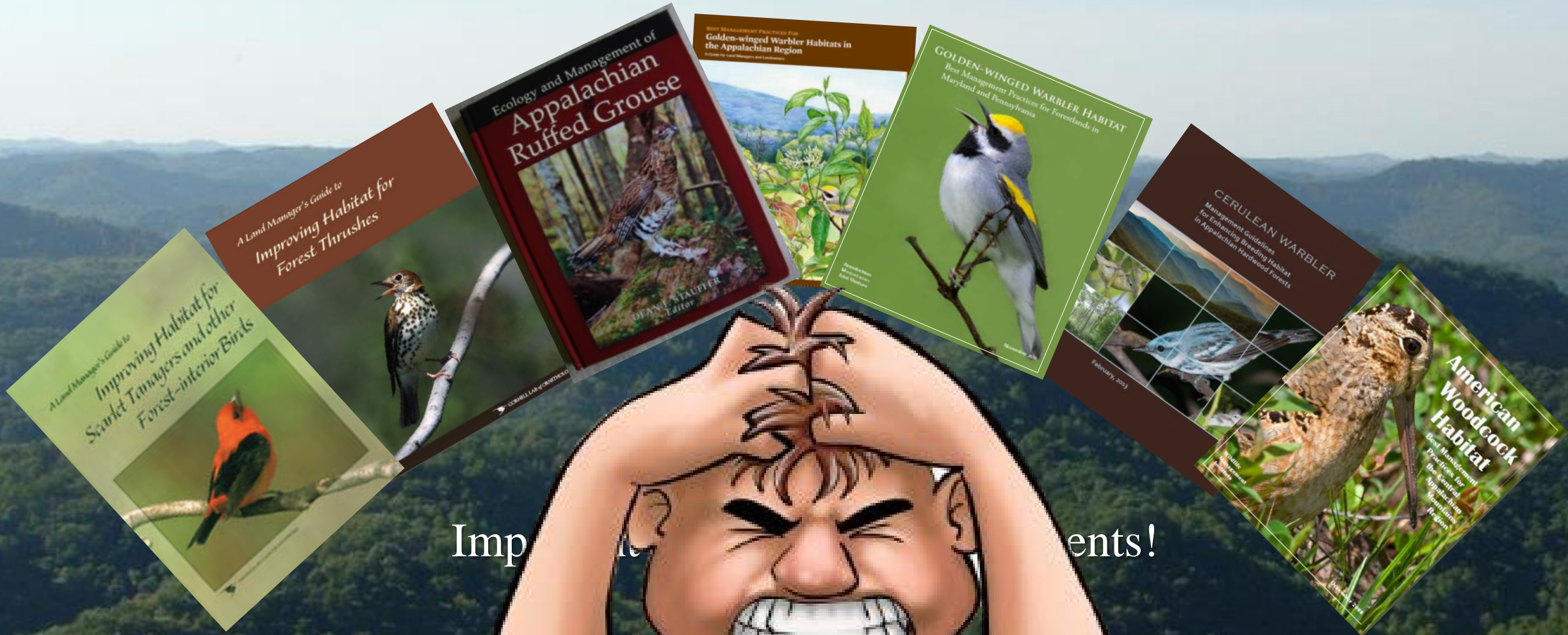
December 2008
 Wildlife
 Management
 Institute

*A Land Manager's Guide to
 Improving Habitat
 for
 Scarlet Tanagers and other
 Forest-interior Birds*

GOLDEN-WINGED WARBLER HABITAT
 Best Management Practices for Forestlands in
 Maryland and Pennsylvania

November 2008
 Appalachian
 Mountains
 Joint Venture

**BEST MANAGEMENT PRACTICES
 Golden-winged Warbler
 the Appalachian Reg.**
 A Guide for Land Managers and Landowners



Imp...ents!



v Sv...nce

A perception is created regarding a decision needing to be made:
Which glossy document (species) is the implementation priority?

Recall, the collective science indicates this decision is not necessary!!!





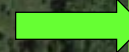
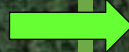
SILVICULTURE

Concepts and Applications
Third Edition

Ralph D. Nyland

in collaboration with
Laura S. Kenefic, Kimberly K. Bohn, and Susan L. Stout

Sustainable forestry provides a continuum of forest conditions for all bird species



*A Land Manager's Guide to
Improving Habitat for
Forest Thrushes*

CERULEAN WARBLER
Management Guidelines
for Enhancing Breeding Habitat
in Appalachian Hardwood Forests

BEST MANAGEMENT PRACTICES FOR
Golden-winged Warbler Habitats in
the Appalachian Region
A Guide for Land Managers and Landowners

Ecology and Management of
Appalachian
Ruffed Grouse



DEVELOPING GUIDELINES FOR PROMOTING POLLINATOR SERVICES AND SHRUBLAND BIRDS IN THE NORTHEAST

“Abundance and diversity, ...were generally positively related to the amount of early-successional habitat on the landscape.” (Roberts and King 2016)



UGA2107025

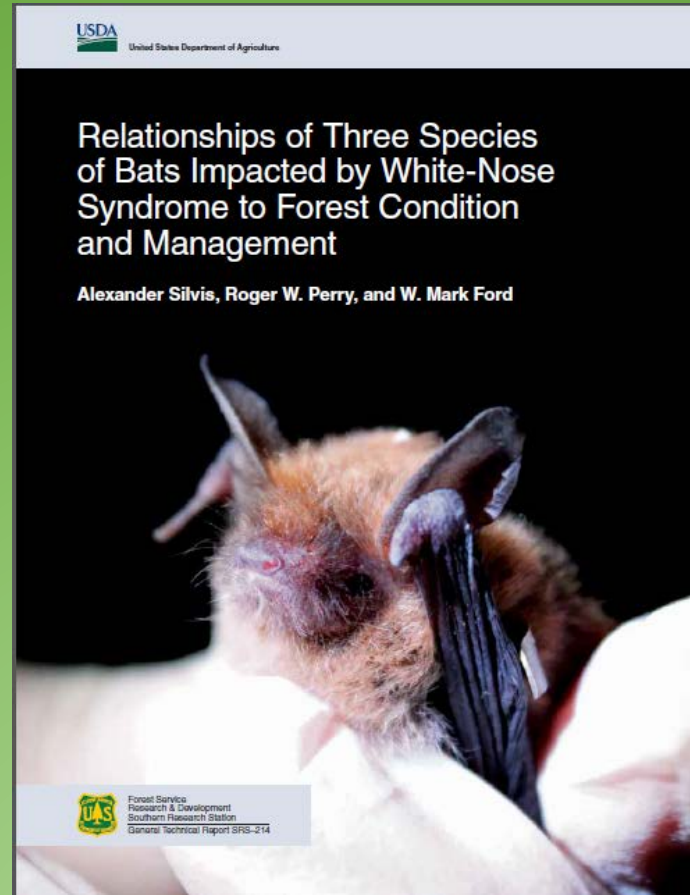
Rest-Site Selection by Fishers (*Martes pennanti*) in the Eastern Deciduous Forest (Wildlife Society Bulletin)

“Maintaining resting habitat for fishers in the eastern deciduous forest can be accomplished through management practices that encourage structurally diverse forests, including retention of coarse woody debris, and variation in tree size and condition.” (Gess et al. 2013)



Habitat Use by Forest Bats in South Carolina in Relation to Local, Stand, and Landscape Characteristics (J. of Wildlife Management)

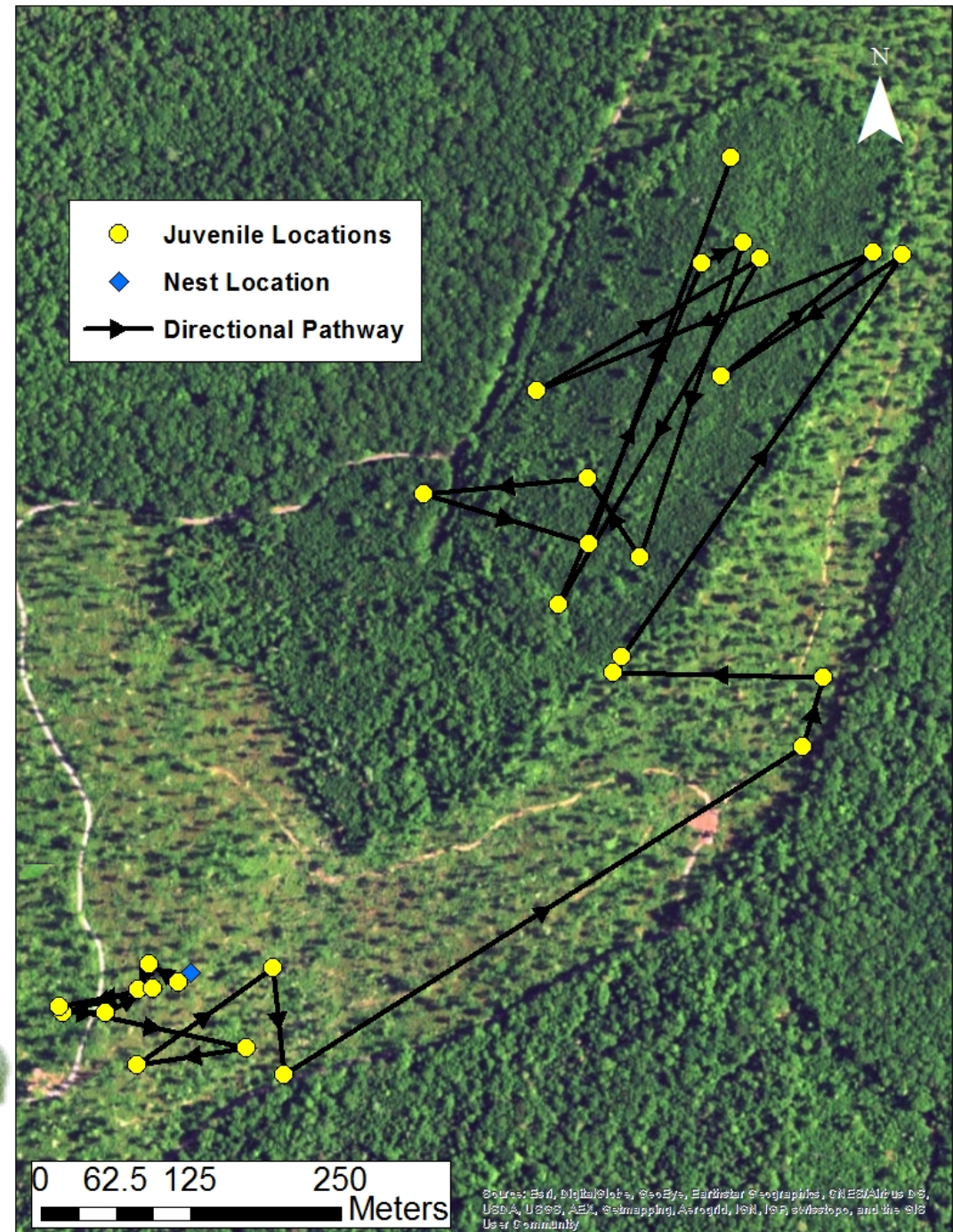
Forest management practices that provide a variety of age classes across the landscape and that create gaps and openings within mid- and late-successional stands will likely provide suitable habitat for bats in the mountains of South Carolina. (Loeb and O'Keefe 2006)



There is logical marriage
between forestry and forest
wildlife conservation

The key to this marriage is the
ability to work at biologically
meaningful scales

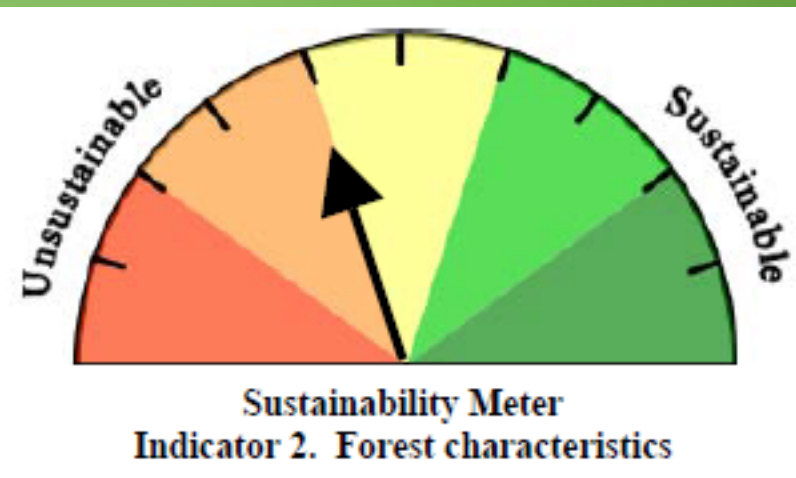
- area
- interspersion



A Shared Vision

“One of the bureau’s primary silvicultural goals is to balance the age distribution of the forest in the multiple resource /commercial land base so that each year, a relatively consistent number of mature acres can be harvested, regenerated, regrown, and reharvested in perpetuity.”

Providing a balance of forest age classes is not only important to forest-bird conservation...its also an goal of foresters and forest managers, in general!



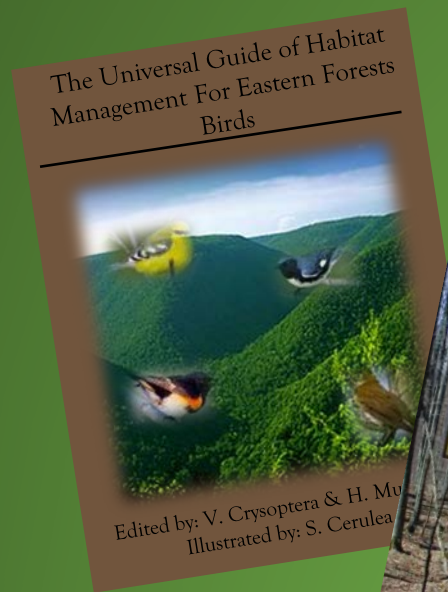
2015 State Forest Resource Management Plan



DRAFT: September 2015



Challenges to achieving the shared vision



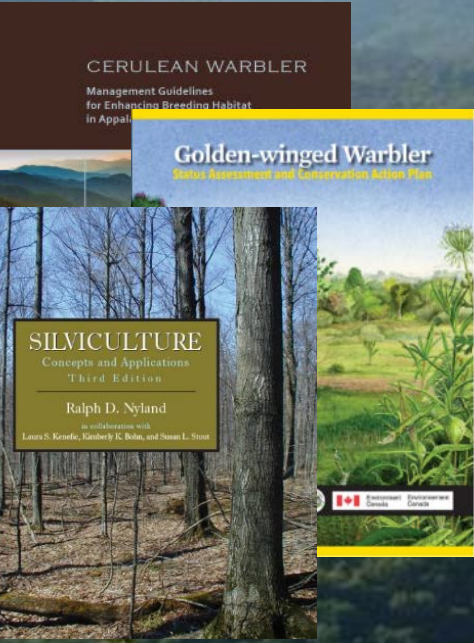
Bottlenecks

- Capacity
- Forest ownership
- Funding
- Succession

Succession requires us to have a conservation strategy that includes **landscape-scale** and **long-term** planning

Building the Team...

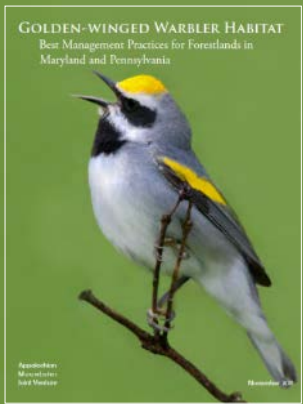
In 2011, a partnership was initiated with the intent to implement Golden-winged Warbler science-based habitat guidelines across PA/MD's public and private forests.



And we went to work!

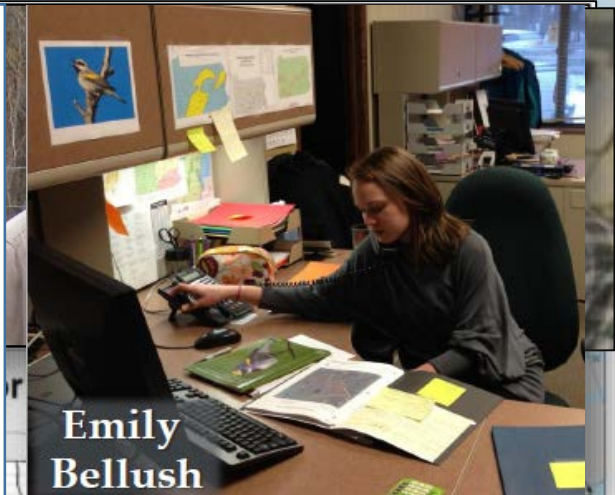
PGC and BOF foresters use the phrase “according to GWWA BMP” when writing commercial and non-commercial plans for State Game Lands and State Forests in the GWWA Focal Area!

Workshops, webinars, invited events, woodland owners meeting, NGO staff trainings, agency staff trainings, etc.



Grants to hire staff.

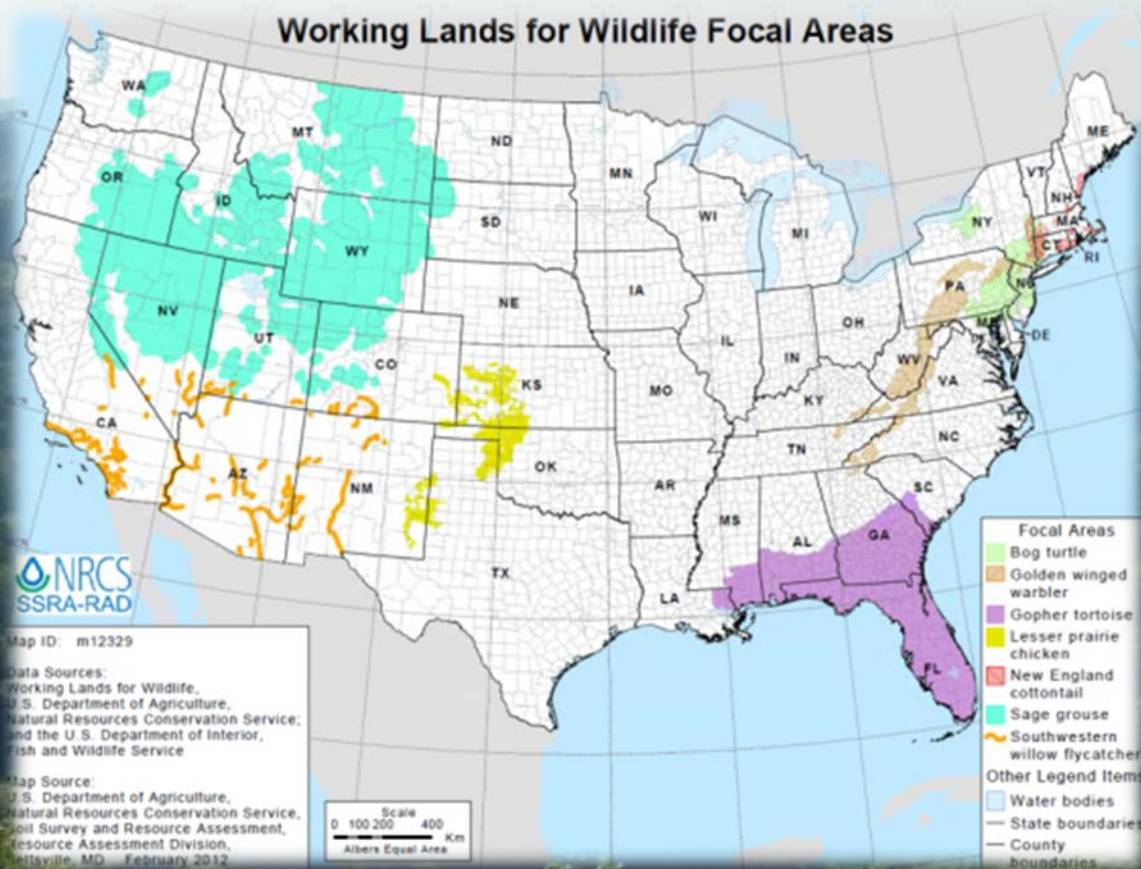
Critical to our success!!!!!!



The Partnership provides the capacity for a “turn key” approach to private lands efforts



> 10,000 acres of GWWA Nesting Habitat Created on private lands in Pennsylvania via NRCS's WLFW



But is implementation on public and private lands producing?

“We have built it...now will they come!”

Program Evaluation and Adaptive Management

- 2015 partners initiated a monitoring effort to evaluate golden-wing, woodcock, and other songbird response to NRCS's private lands programs and public land management that target Golden-winged Warbler
- Monitoring primarily funded by NRCS-Conservation Effects Assessment Project
 - Additional funding: American Bird Conservancy, National Fish and Wildlife Foundation, & state agencies
 - 5 states (MD, PA, NJ, MN, WI)
 - 2 graduate students (Cornell and IUP) & a lot of technicians!



American Woodcock

Monitored treated sites in

2015 (n=370 points)

2016 (n=643 points)

Golden-winged Warbler & Songbirds

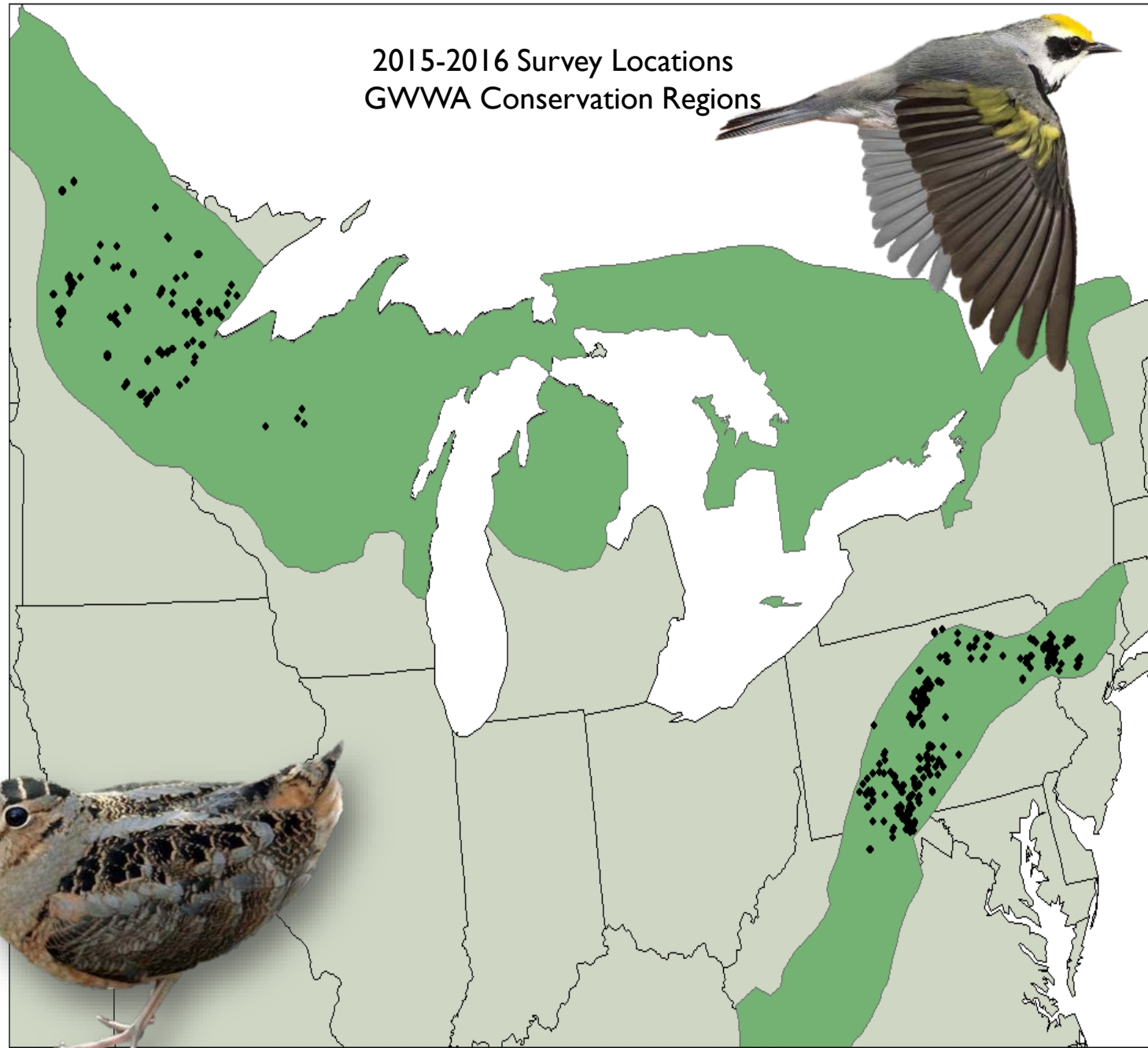
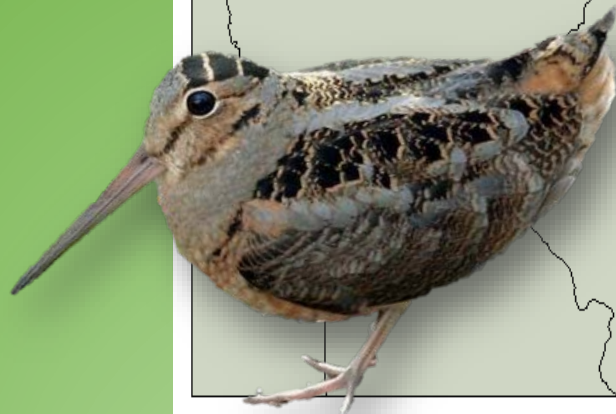
Monitored treated sites in

2015 (n= 456 points)

2016 (n= 818 points)

Vegetation Surveys

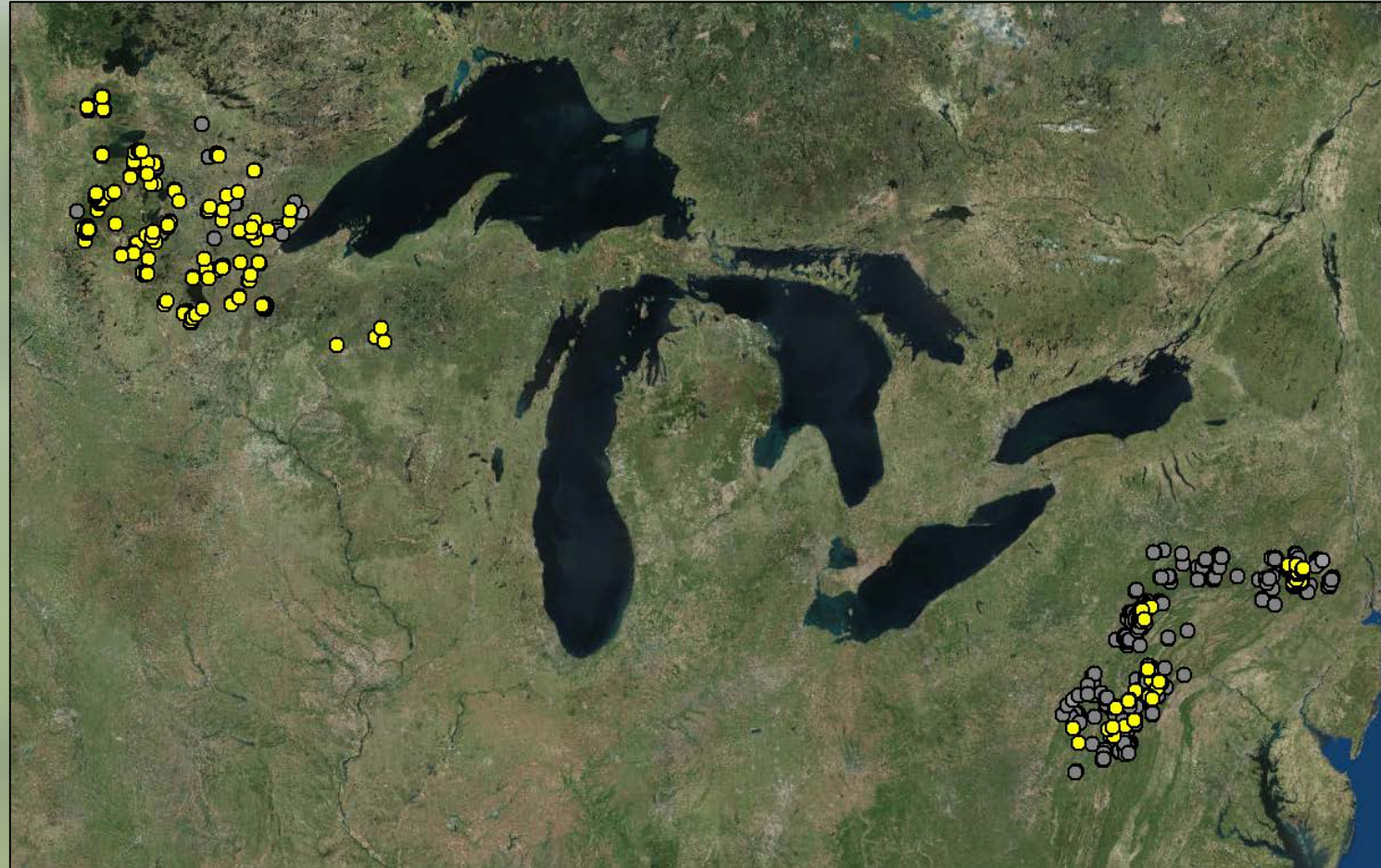
All points surveys





Golden-winged Warbler Monitoring

- Golden-wing Detections
 - N = 508 in 2015
 - n=138 in Appalachian
 - n=370 in Great Lakes
 - N= 1,186 in 2016
 - n=298 detections in Appalachians
 - n=888 detections in Great Lakes



2015 Priority Areas for Conservation (PACs)

Within 5 miles of GWWA since 2004

- PGC monitoring
- CEAP monitoring
- 2nd PA BBA
- eBird

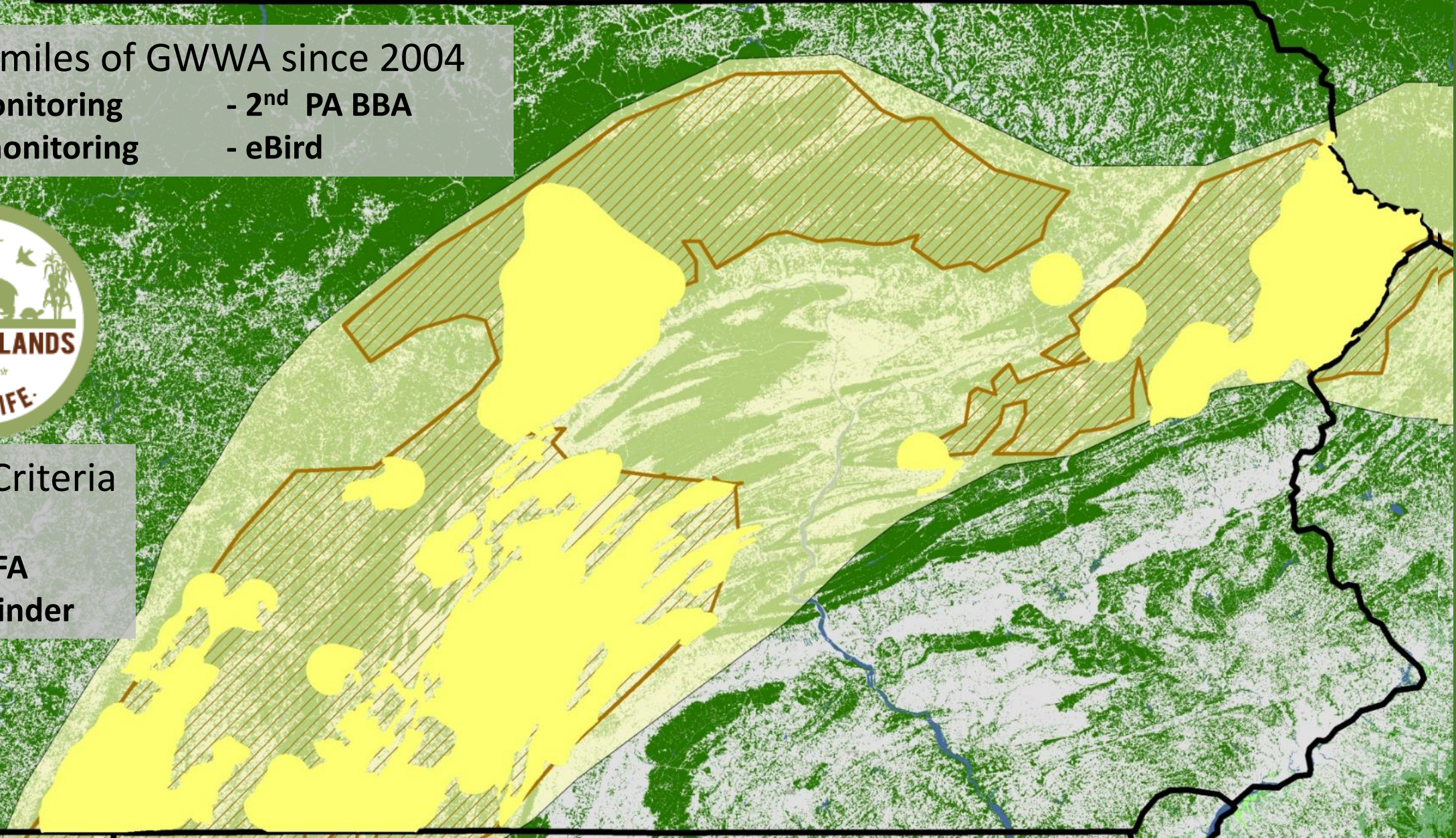


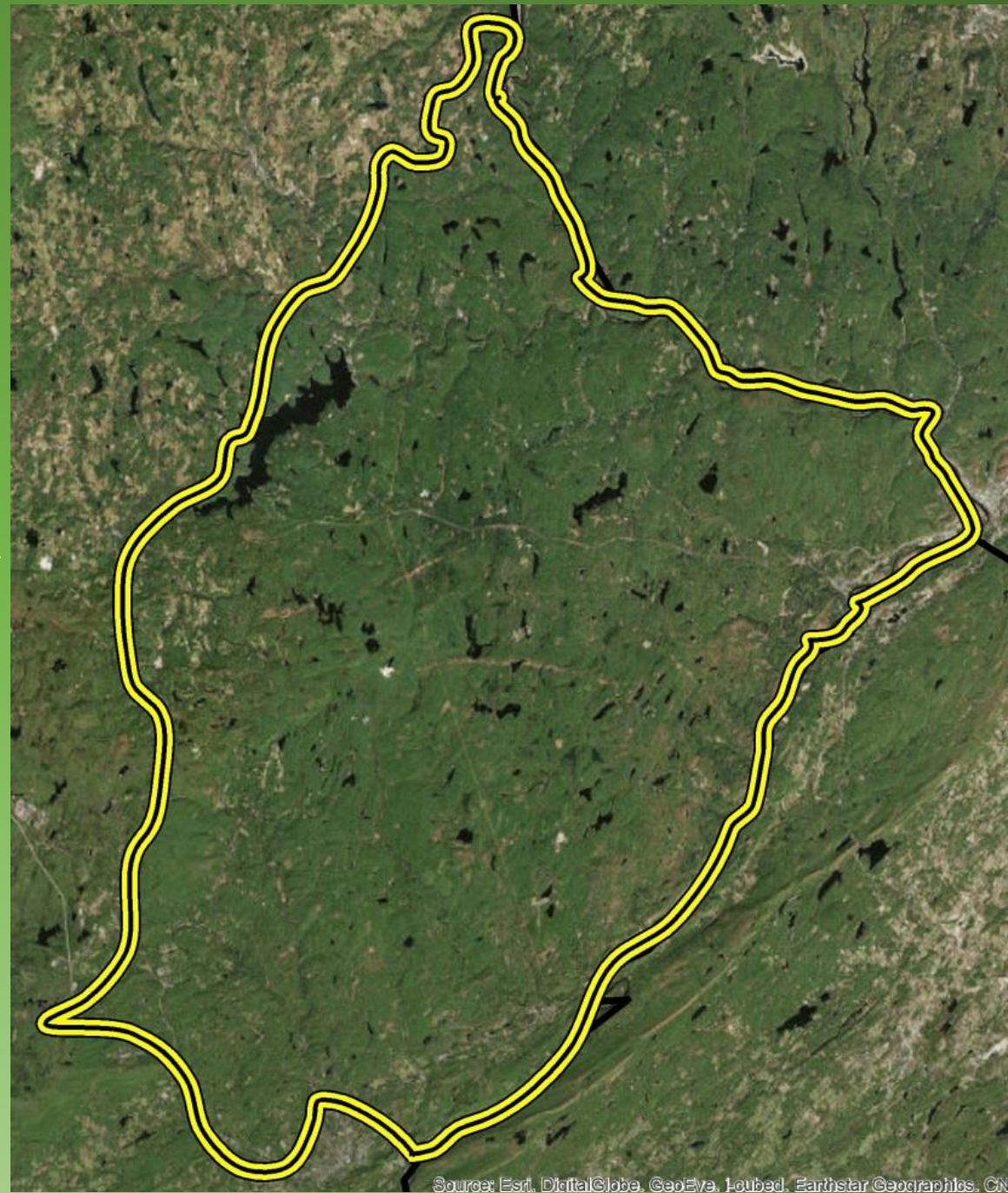
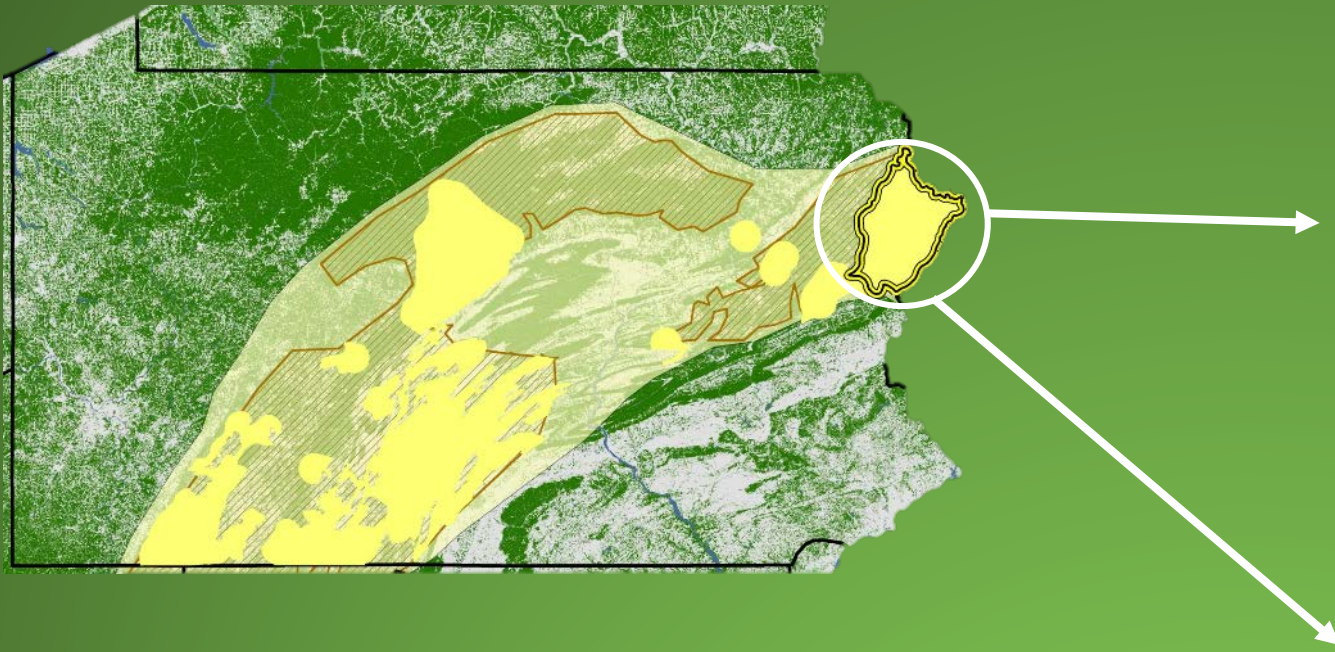
Ranking Criteria

High = PAC

Medium = FA

Low = remainder





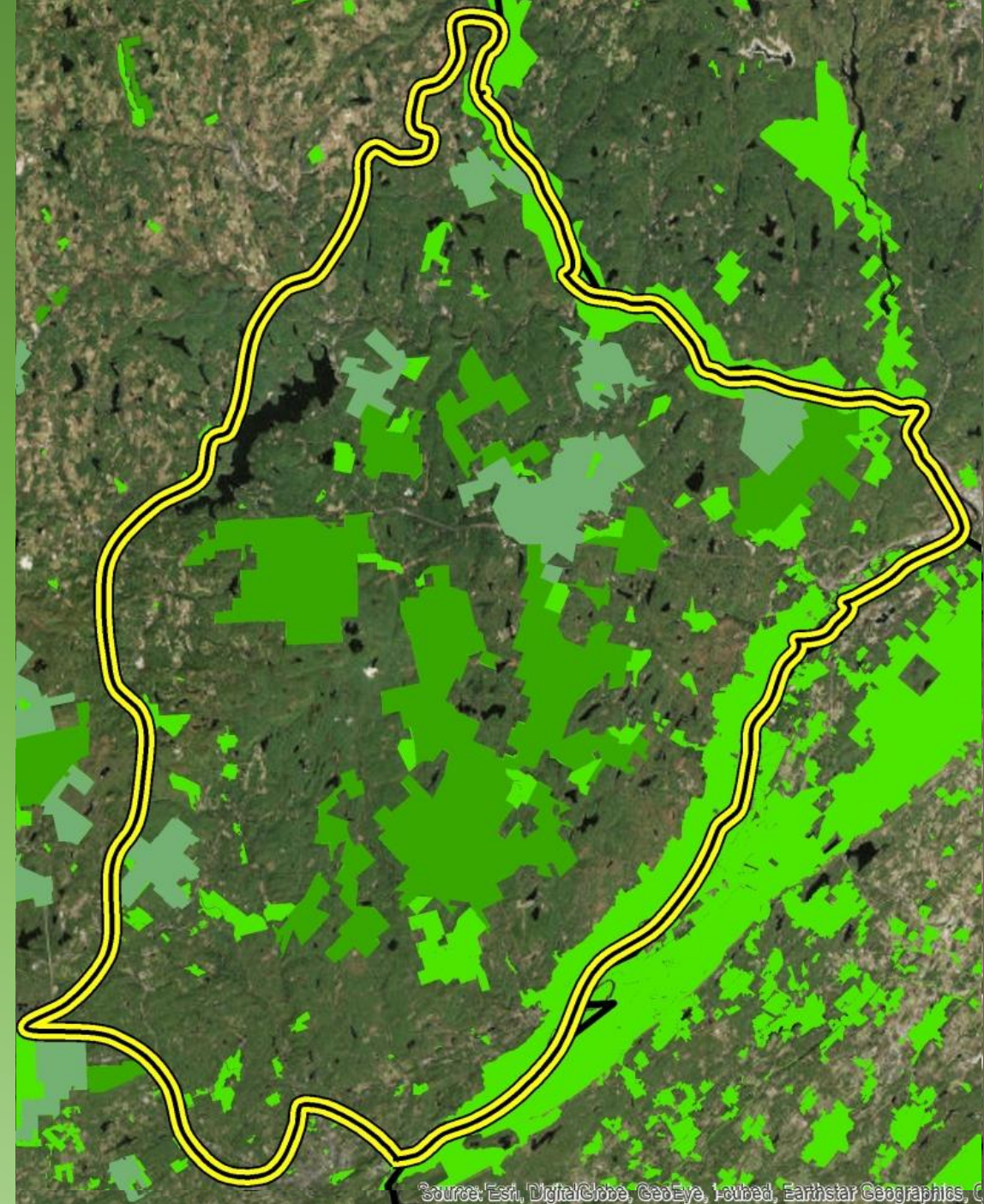
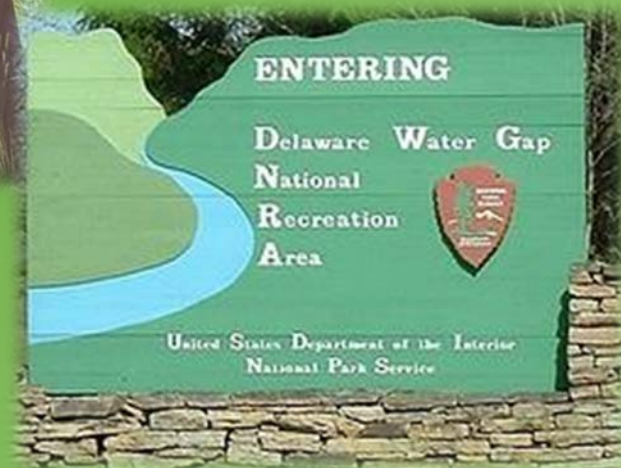
Source: Esri, DigitalGlobe, GeoEye, Ikonos, Earthstar, Geographics, CN

Poconos- *Birdscape* / Focal Landscape

- GWWA-PAC
- 185,000 ha (470,000 ac) (total area)
- Mixed Oak & Northern Hardwoods
- leadership of PA-NRCS, DCNR-BOF, & PGC provided letters of support.

Public Ownership

- Public Ownership (~ 40%)
- DCNR: 83,500 acres
- PGC: 29,100 acres
- Federal: 51,000 acres





44-acre non-commercial (winter 2013)

Delaware State Forest: Special Management Area

2,500 acres of which 1,200 acres = to enter the short rotation



Public Forests



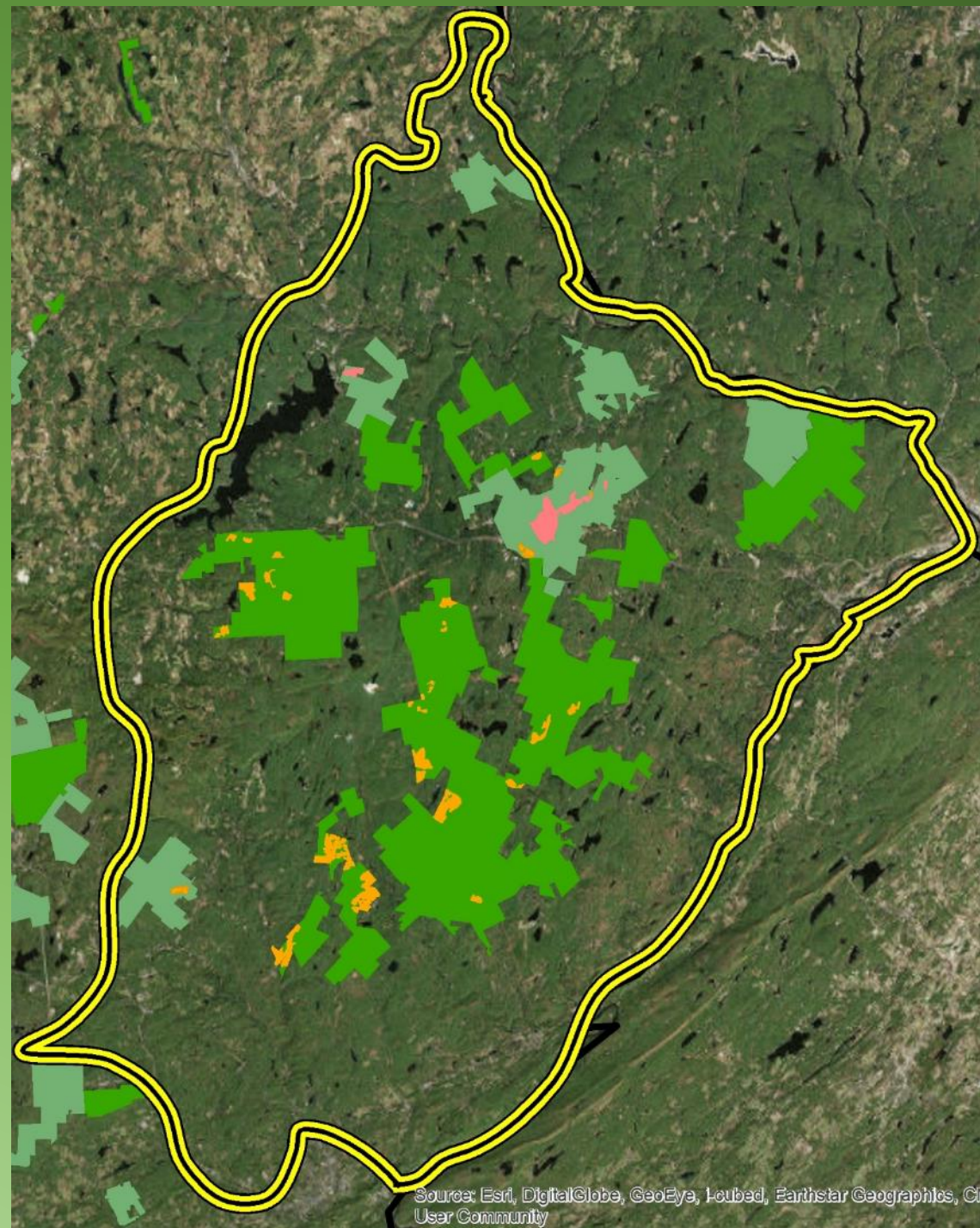
Poconos- GWWA Cooperative Management Area

DCNR: 2,468 acres overstory removals w/residuals

PGC: 396 acres overstory removals w/residuals

Total: **2,864** acres overstory removal w/residual

** Does not include preparatory treatments (i.e., 1,041 acres Rx fire on PGC) or shelterwoods*

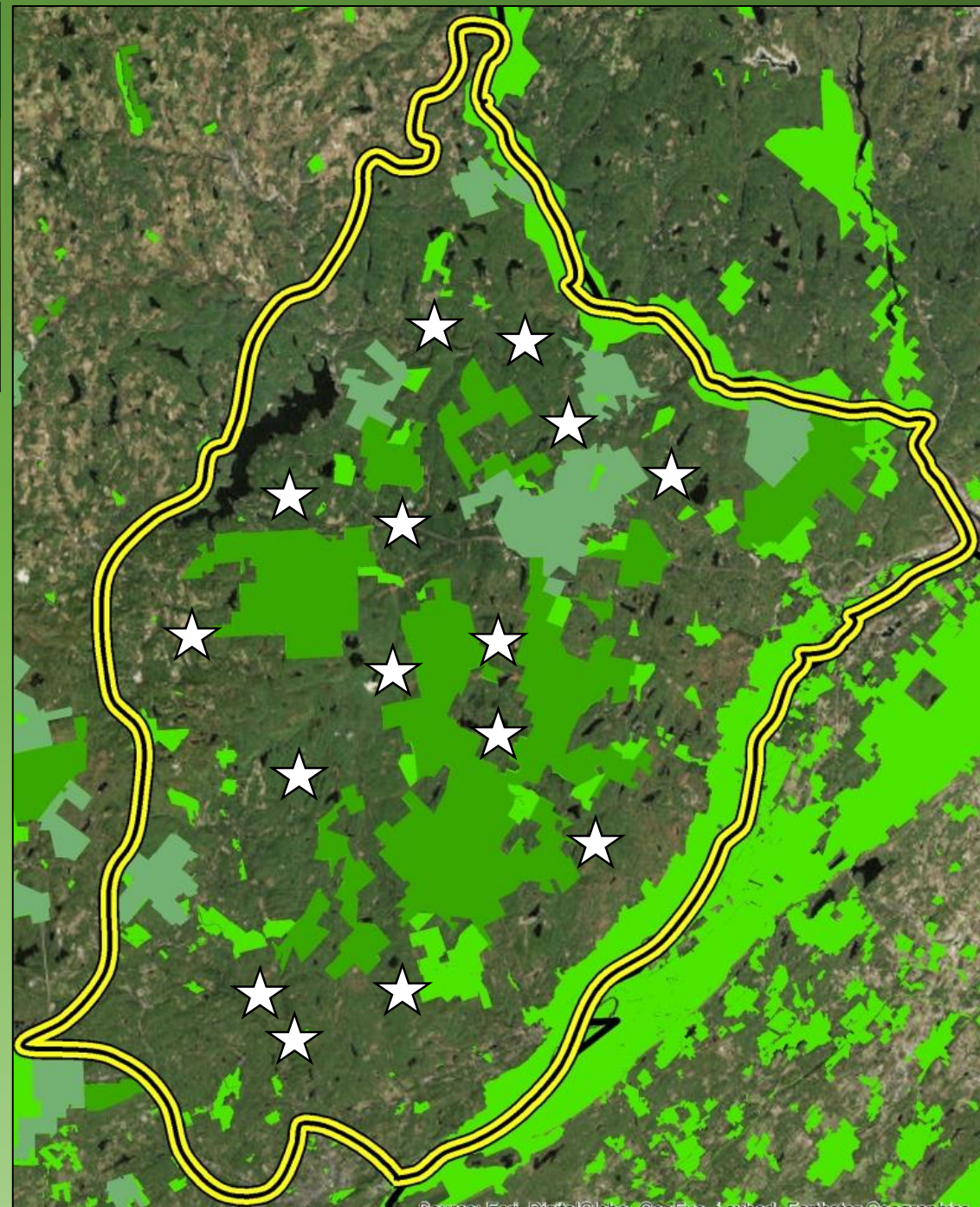


Working Lands for Wildlife

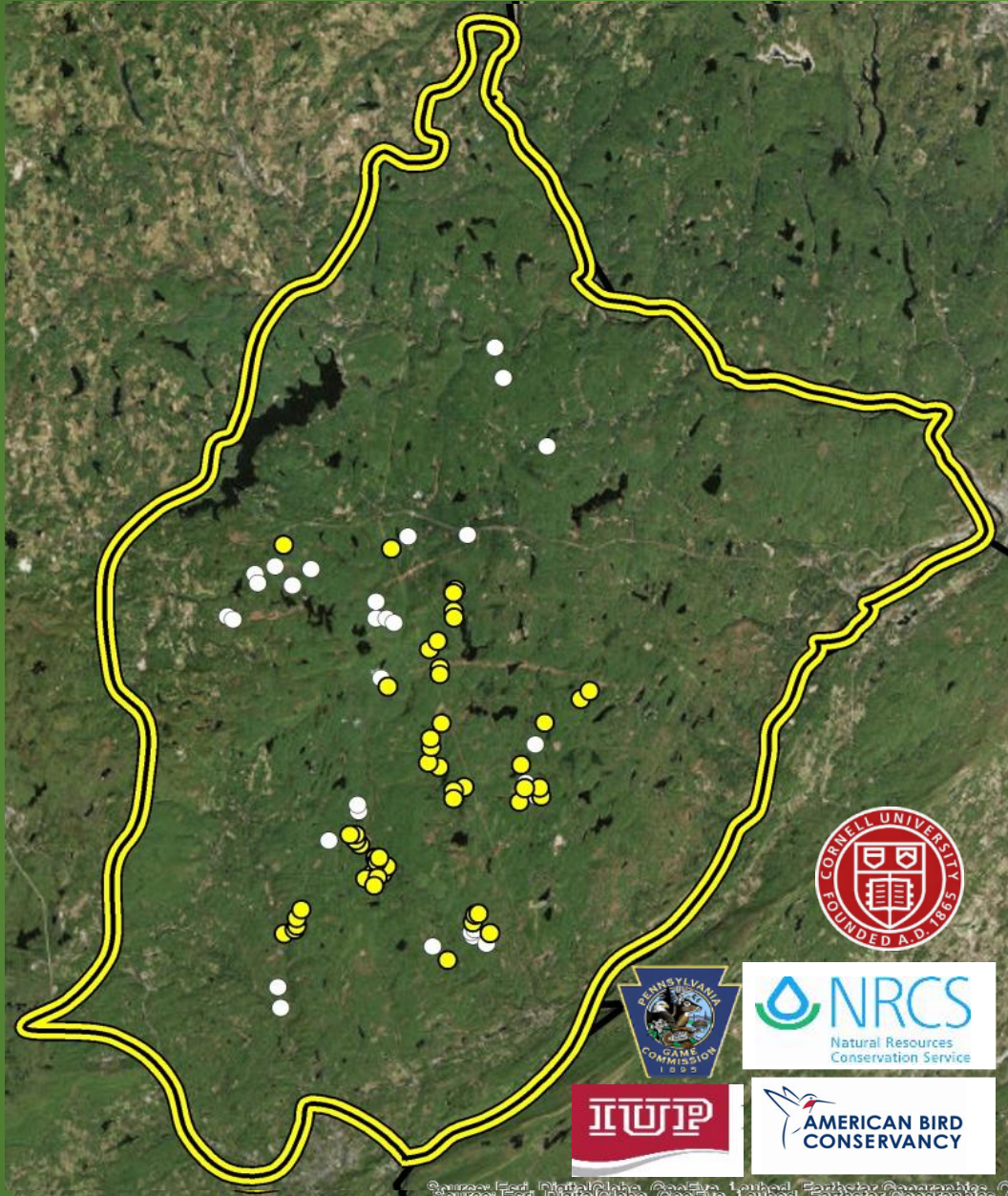
Conservation Beyond Boundaries **WLFW**

Poconos- GWWA Cooperative Management Area

- No. of private landowners contracted: **15**
- No. of acres contracted: **1,160 acres**
- Many more NRCS applications in process



NRCS-Conservation Effects Assessment Project



GWWA Demographics Poconos Region

Multi-year estimates for:

- Site Occupancy
- Minimum adult annual survival
- Territory density
- Pairing success
- Nest survival 2012-15 (n=148 nests)
- Mean no. of fledglings/ successful nest
- Fledgling survival to independence (n=72)
- Wintering location known

- 
- Poconos-focal landscape: a model for forest wildlife conservation that transcends ownership boundaries and operates at biologically meaningful spatial and temporal scales
 - Partnership that is built upon:
 - shared vision
 - shared workload
 - shared success (credit!)
 - science
 - ability to recognize and create opportunities -
 - win-win for wildlife & forestry & landowners
 - desire to evolve

Growing the Partnership and Capitalizing on Opportunities

PA and MD- Cerulean Warbler Appalachian Forestland Enhancement Project

Total annual Funding- \$1,000,000



Sustaining Pennsylvania's Oak Ecosystems through Partnership in Forest Management

Total FY 2017 Funding - \$1,074,030

(NRCS - \$350,000 Forest Service- \$724,030)

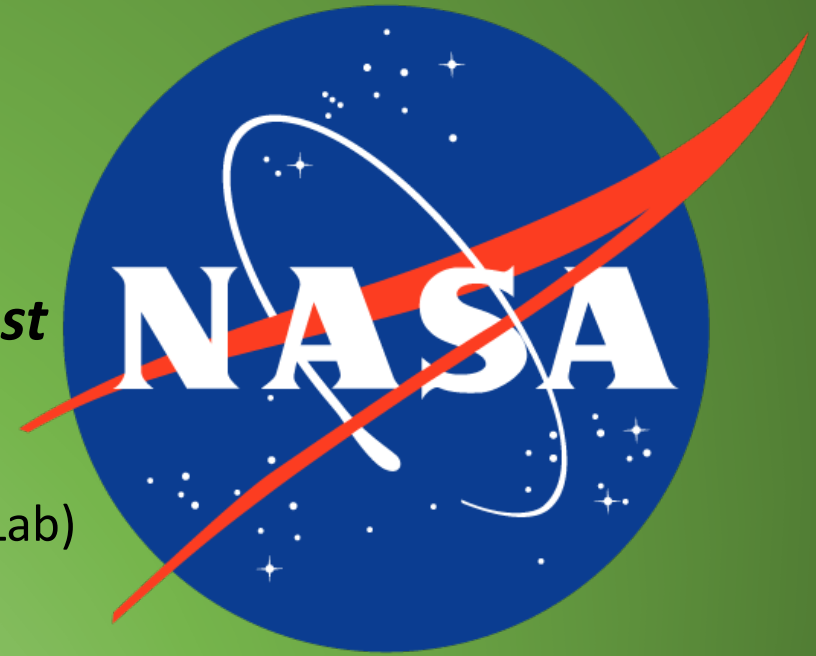


Forest Management Planning tools

NASA's EARTH SCIENCE APPLICATIONS: ECOLOGICAL FORECASTING

Project title: *Managing forests for sustainable harvest and wildlife habitat using earth observations and modeling of forest structure and landscape connectivity*

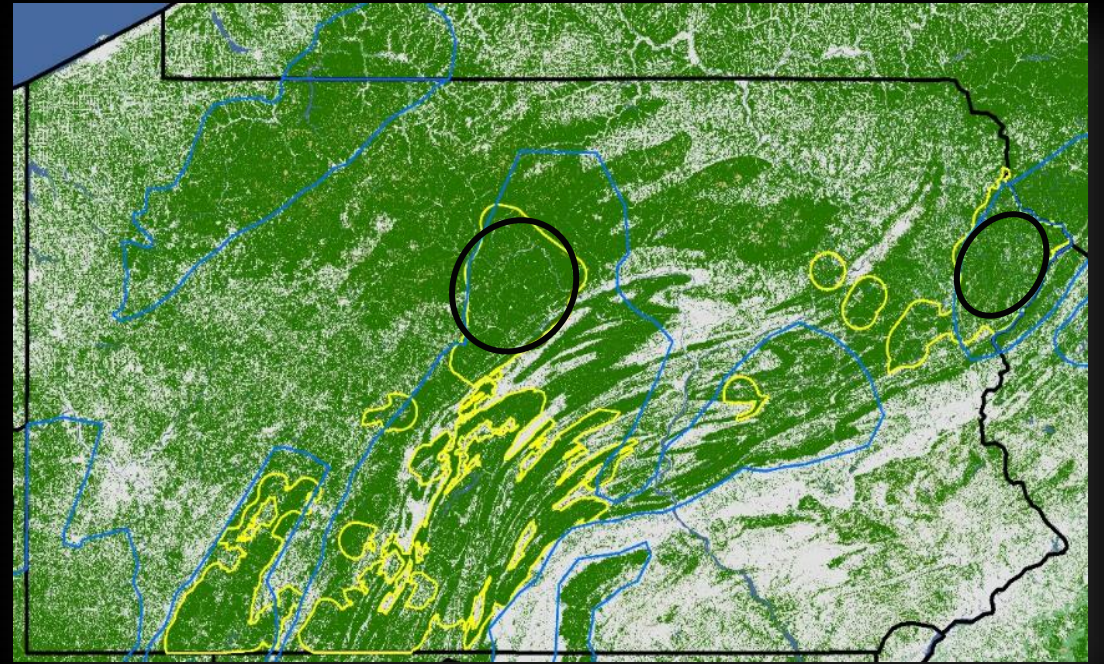
Andrew J. Elmore & Matthew C. Fitzpatrick (University of MD: Appalachian Lab)
Collin Shephard (USFS-ANF)
Joesph Petroski (DCNR)
Jeffrey Larkin (IUP/ABC)
Ben Jones (PA Game Commission)



The Conservation “Canvas” for Eastern Forest



Identification of Focal Forest Landscapes



Where should we focus our time and resources?

THANK YOU!

“There is no limit to what can be accomplished if it doesn't matter who gets the credit.” R.W. EMERSON

