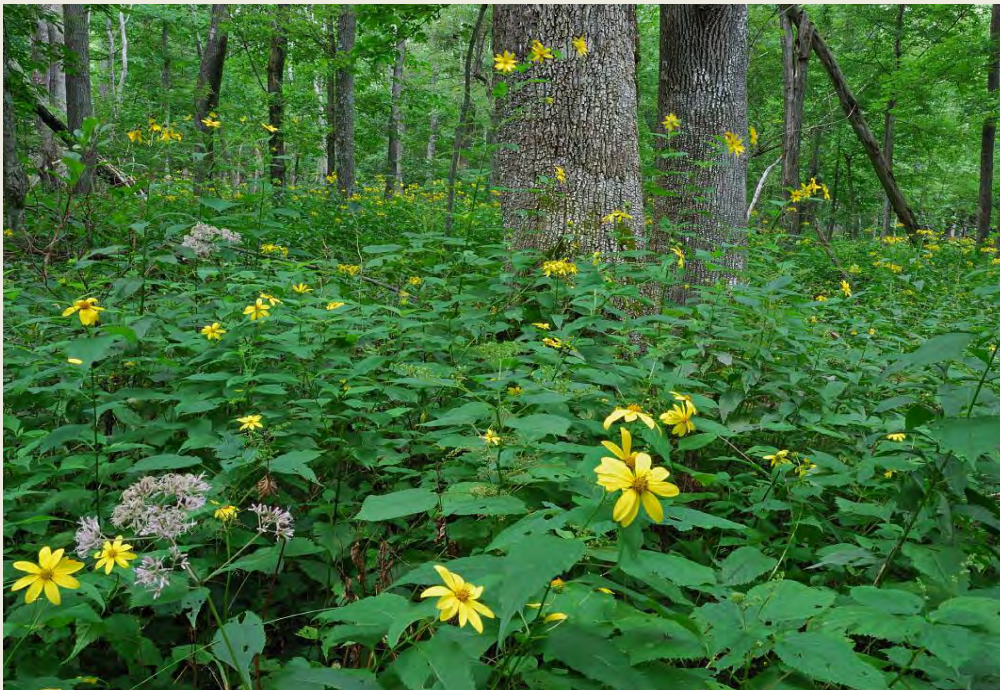


Essential Conservation Sites

Virginia Natural Heritage Program



Conserving Virginia's biodiversity through inventory, protection, & stewardship.



Requisite Sampling of Pretty VA diversity



Barking Tree Frog (*Hyla gratiosa*) – species of “high conservation need” in VA



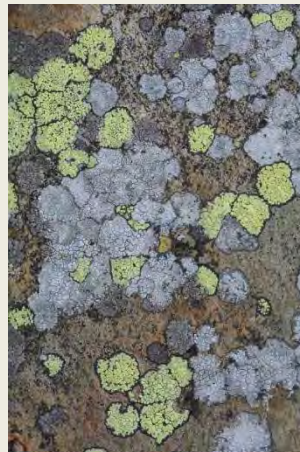
Roanoke logperch (*Percina rex*) – VA “near endemic”; federally endangered



Millboro Leatherflower (*Clematis viticaulis*) – endemic to 2 VA counties; state threatened



Lee County Cave Isopod (*Lirceus usdagalon*) – an “unpigmented troglobyte”, one of nearly 200 narrow cave endemics in VA



At least 13 lichens & liverworts found in VA are globally rare



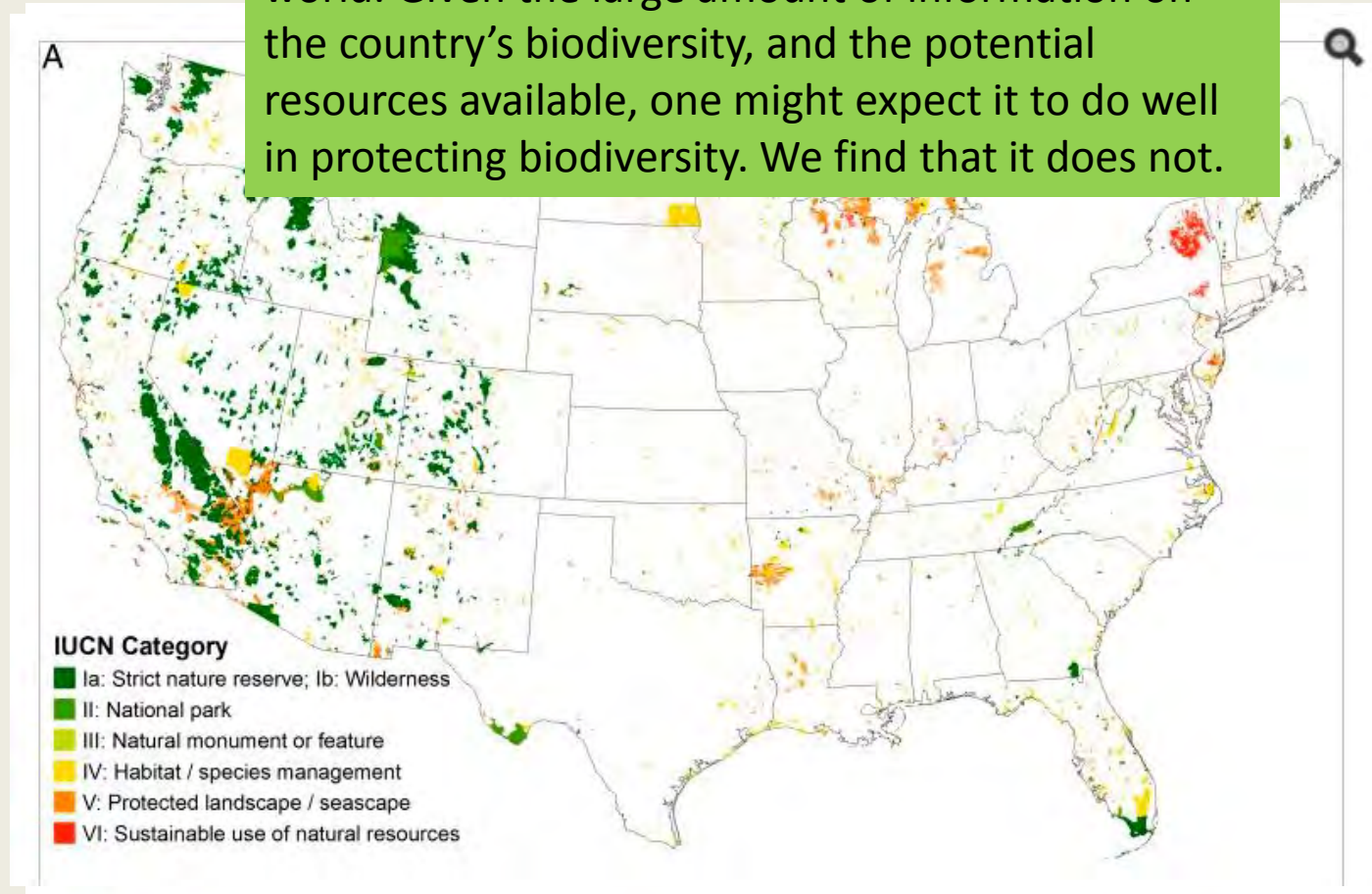
Powell River Mussel diversity - is one of highest in the world; numerous endangered species



Mitchell's Satyr (*Neonympha mitchellii*) – “one of the world's most endangered butterflies”; known from Floyd Co

Inefficient Capture – Universal Problem

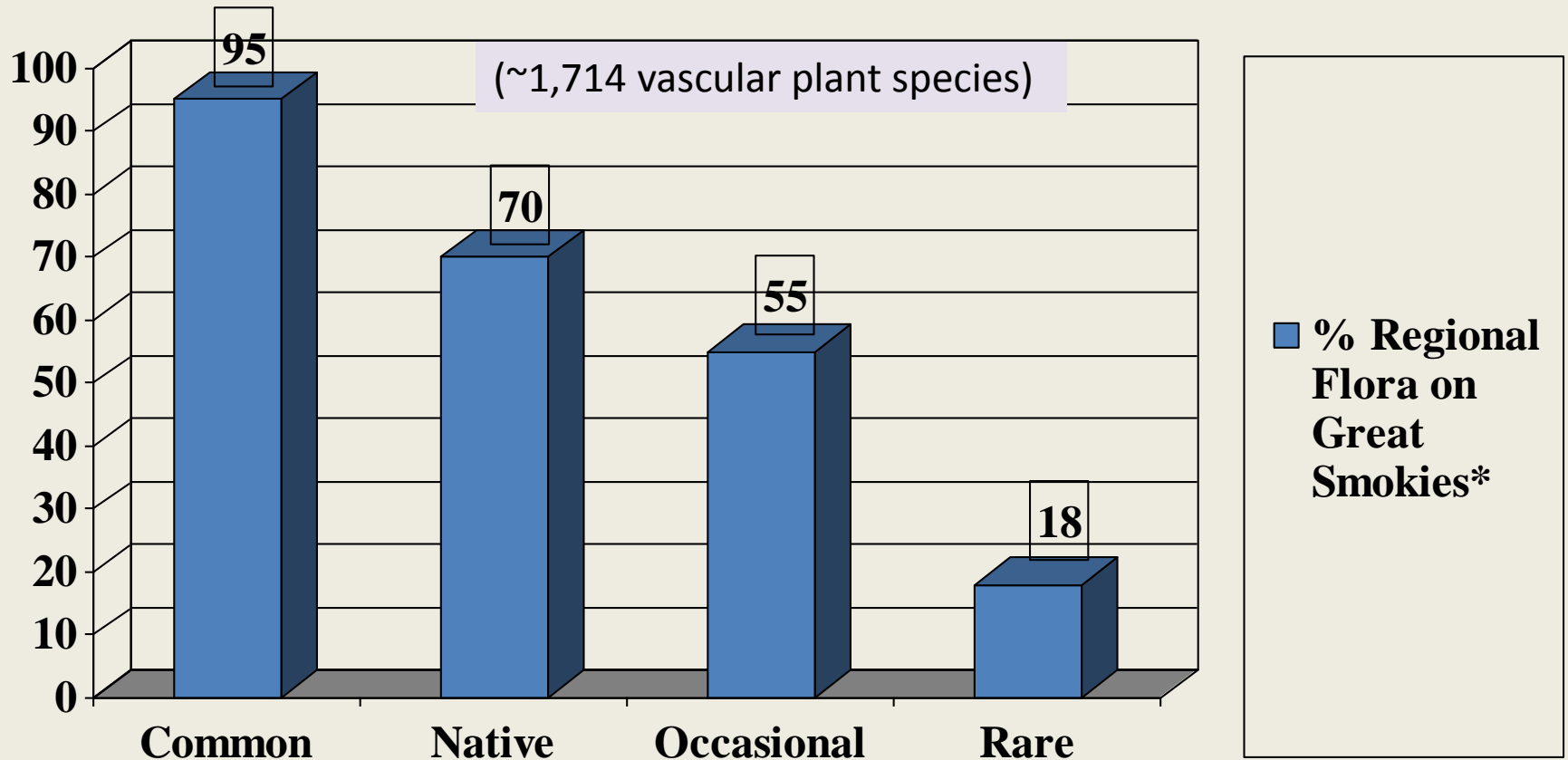
The United States has one of the oldest and most sophisticated systems of protected areas in the world. Given the large amount of information on the country's biodiversity, and the potential resources available, one might expect it to do well in protecting biodiversity. We find that it does not.



From Jenkins, *et al.* 2015, Proc. Natl. Acad. Sci.

Great Smoky Mountain National Park

(@522,247 acres – most biodiverse US National Park)

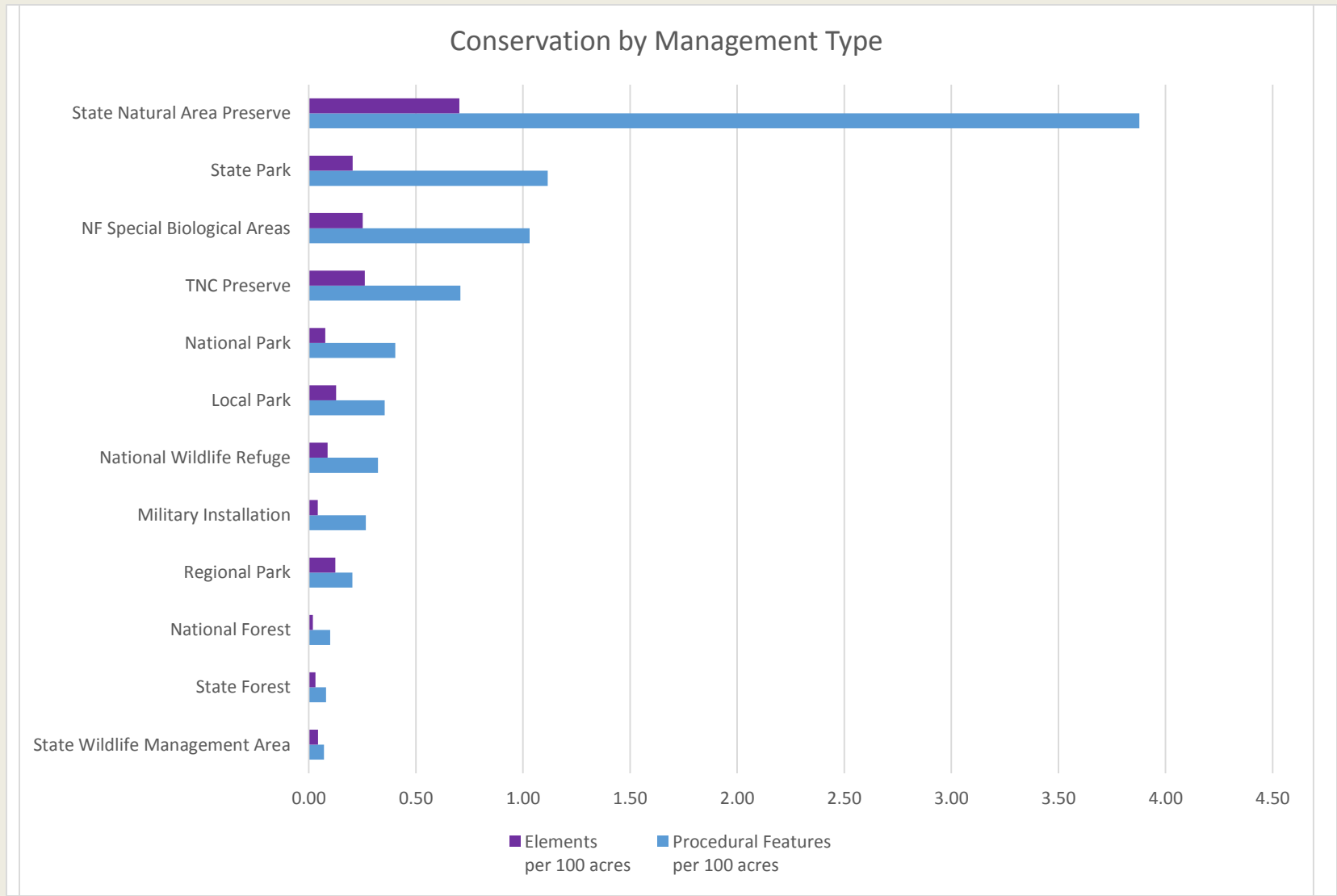


data courtesy of Dr. Peter White, UNC Chapel Hill

Natural Area Preserves

(or whatever your state call them).....

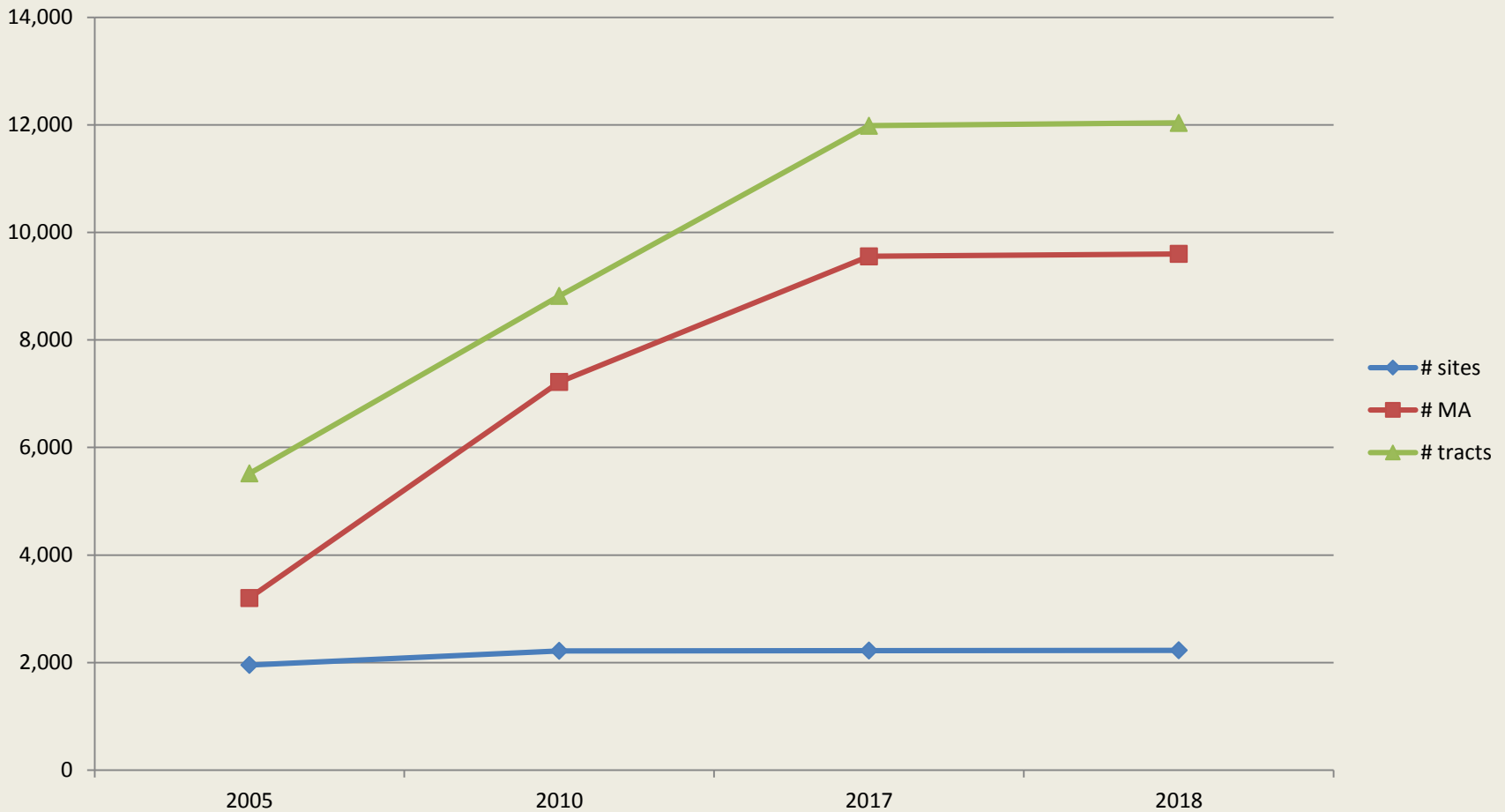
Lifeboats of hope



Ongoing Conservation Effort across Virginia

July 1 – Dec 31, 2017 Permanently Protected Acres via recorded instruments/deeds			
Entity Level	Fee Simple	Easement	Totals
Federal	1,296.63	0.00	1,296.63
State	4,794.76	7,226.88	12,021.64
Private/Land Trust	359.27	8,951.08	9,310.35
Local	66.54	782.21	848.75
VOF	0.00	20,921.92	20,921.92
July 1 – Dec 31 Totals:	6,517.20	37,882.09	44,399.29
Total Acres Protected July - Dec 2017:	44,399.29		

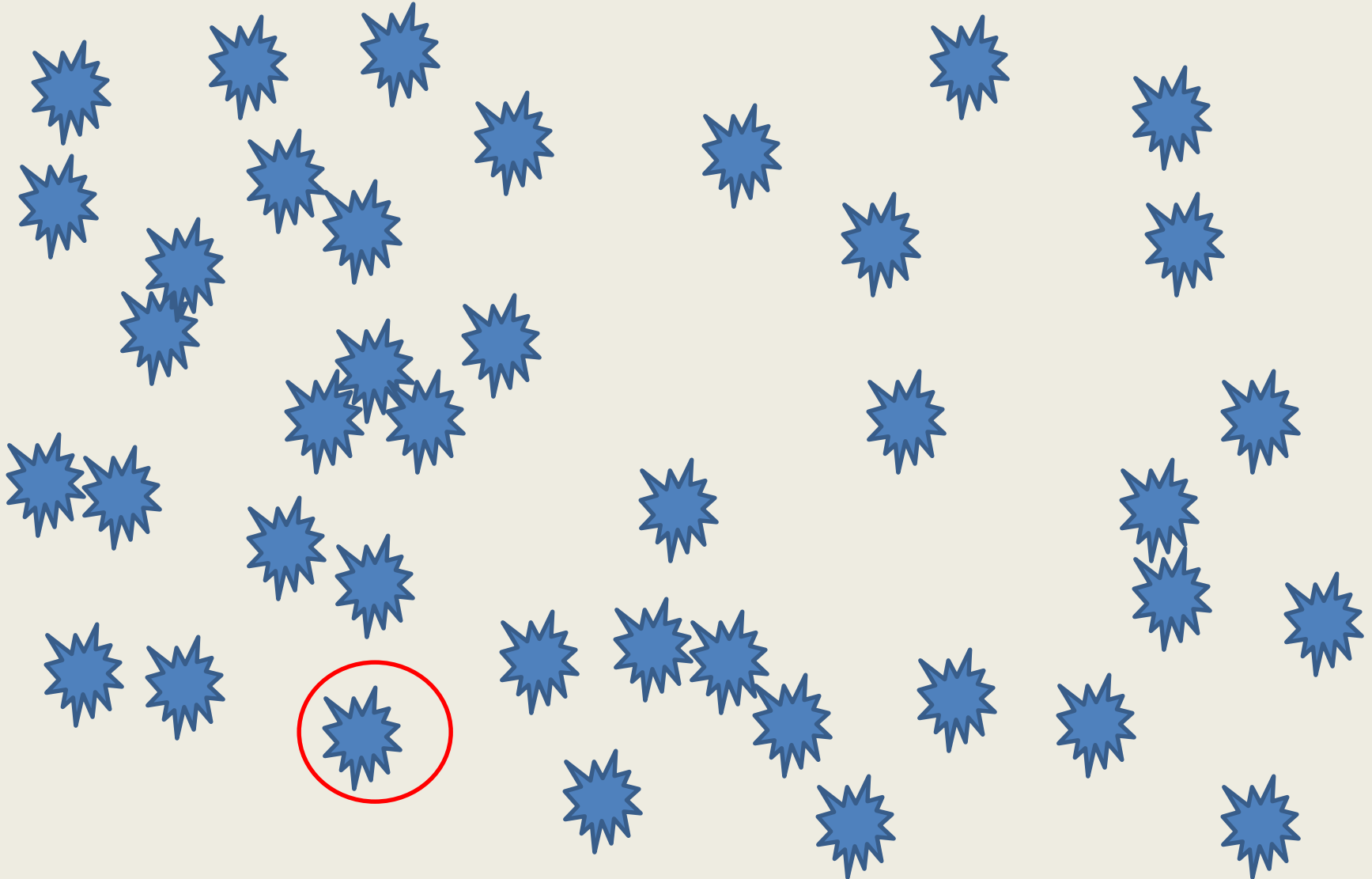
“conservation effort” has risen steadily since 2005..
“conservation need” relatively static*



* 428 EO increase, 274 site increase (15 yrs)

Inefficient Capture of EOR's

~2.8% projects protect EOR's, and only ~ 2% tracts expand existing "managed areas"



Preserve the natural diversity of biological resources of the Commonwealth

CURRENT CONDITION:

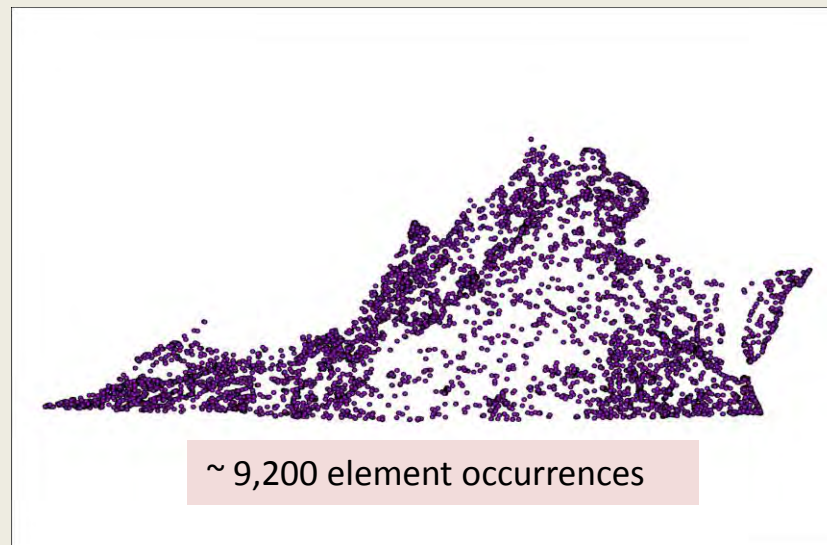
~ 35% EOR's "protected"
4,072,000 acres "conserved"
~ 16% of VA"



ALL EOR's PROTECTED?

12,000,000 acres required
~ 50% of VA "in conservation",
496 years to complete

Opportunistic conservation
Highly inefficient capture rate



Improve the “managed area” efficiency of partners ?

Natural Area Preserves



other “managed lands”



This Natural Area Preserve was supported by the Land and Water Conservation Fund - helping states and communities provide outdoor recreation and open space for all Americans.

Additional funding was provided by the Virginia Land Conservation Foundation.



Commonwealth Conservation Vision (CCV):

The native biological diversity of the Commonwealth will be effectively and efficiently conserved on a **comprehensive network of protected lands**. These lands will be adequately protected, adequately managed & restored, and treasured by Virginia citizens.



Once assembled and protected, the conservation network will create a “Noah’s Ark” that collectively includes viable populations of all native species and natural communities.

Essential Conservation Sites

..... are a tool for representing key areas of the landscape where protection and stewardship action is most critically needed to ensure the long-term viability of at least one natural heritage resource that is the best example known to remain in Virginia.



Critical Components of ECS

(Essential Conservation Sites)

- Comprehensive (explicitly includes all elements)(slightly minimizes influence of global rarity)
- Quality Driven (includes the “best” of each element, as defined by EO ranks)
- Redundancy (include at least 2 of every element, 5 of global rarities)
- Irrespective of ownership (see “the best” above)
- Ability to share product (& gain buy-in from numerous potential partners)

Automating ECS

Selection Examples

- *Botrychium simplex* var. *simplex*
 - G5, only 2 EO's in VA, both viable, both selected, both already protected
- *Buchnera americana* – G5, nine EO's in VA, pick 2

EO RANK	Managed Area?	Target
AB	Cleveland Barrens NAP	<i>Buchnera americana</i>
B	Cleveland Barrens NAP	<i>Buchnera americana</i>
B	NA	<i>Buchnera americana</i>
C	NA	<i>Buchnera americana</i>
C	NA	<i>Buchnera americana</i>
CD	NPS,VOF,CWT	<i>Buchnera americana</i>
CD	NPS,VOF,CWT	<i>Buchnera americana</i>
D	NA	<i>Buchnera americana</i>
E	NA	<i>Buchnera americana</i>



Buchnera americana

Automating ECS

Cardamine micranthera – G2, twenty-four VA EO's,
pick 5 best

EO RANK	Managed Area?	Con Site Name
A	private	LITTLE MILL CREEK
A	private	MILL CREEK TRIBUTARY
A	private	NETTLERIDGE CREEKS
A	private	SPOON CREEK
AB	private	EASTERN ELK CREEK TRIBUTARY
AB	private	ELK CREEK
AB	Local 14%	LONG BRANCH
AB	private	PETERS CREEK CENTRAL
AB	private	PETERS CREEK NORTH
AB	private	PETERS CREEK SOUTH
AB	private	PETERS CREEK TRIBUTARY AT RT. 660
AB	private	SANDY CREEK - PATRICK COUNTY



“Essential ConSites” GIS Protocol – Terrestrial Sites



ECS Prelim. Summary

664 “essential” sites



- ~ 25% sites – fully protected
- ~ 54 % sites – partially protected & significant conservation partners exist
- < 20% sites – fully private ownership

“Rarity” of highly significant natural features private lands

~ 90% of VA land area (pvt)

= ~ 27 % of the NHR's

Only 2% have outstanding biodiversity significance

~ 76,000 acres of Targeted acquisitions are needed



VA's terrestrial biodiversity hotspots:

Sites with (20+ irreplaceable elements)

Balsam Mountains (n=37)

Potomac Gorge (n=35)

False Cape (n=33)

Laurel Fork (n=32)

Zuni (n=27)

Assateague Island (n=20)



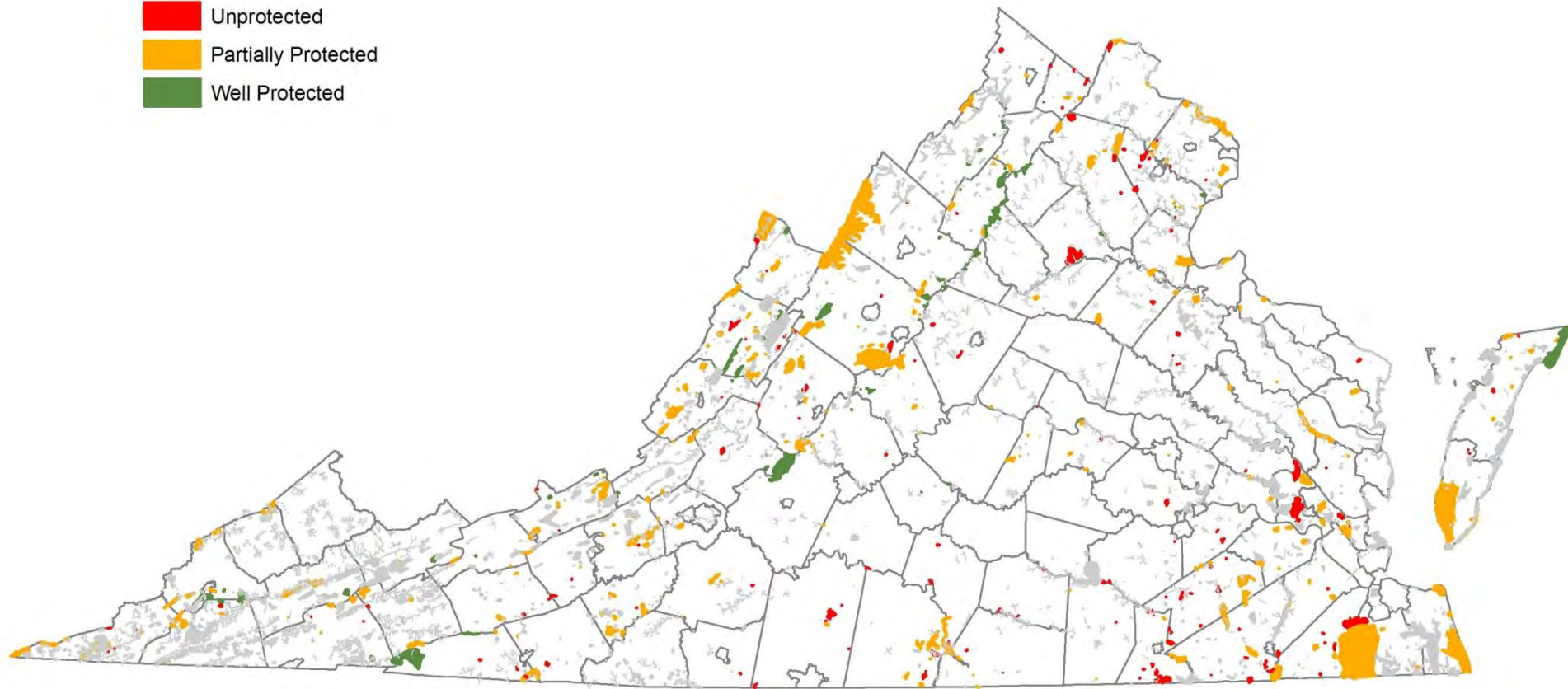
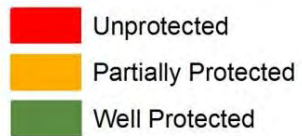
False Cape State Park and Natural Area Preserve



Balsam Mountains Massif – numerically most significant biodiversity hotspot in VA



Potomac Gorge – 35 “best” elements present



“Act well your part, there all the
honour lies”





“choose large goals that while difficult are potentially game-changing and universal in benefit. To strive against odds on behalf of all of life would be humanity at its most noble. (E.O. Wilson)