

Old Growth Grassland

Characteristics

154

CONCEPTS AND QUESTIONS

Toward an old-growth concept for grasslands, savannas, and woodlands

Joseph W Veldman¹, Elise Buisson², Gisela Durigan³, G Wilson Fernandes^{4,5}, Sébastien Le Saout⁶, Gregory Mahy⁷, Daniel Nguyen⁸, Jonathan E Overbeck⁹, Robin G Veldman¹, Nicholas P Zakaoui⁸, Francis E Putz¹⁰, and William J Bond¹

We expand the concept of "old growth" to encompass the distinct ecologies and conservation values of the world's ancient grass-dominated biomes. Biologically rich grasslands, savannas, and open-canopy woodlands suffer from an image problem among scientists, policy makers, land managers, and the general public, that fosters alarming rates of ecosystem destruction and degradation. These biomes have for too long been misperceived as the result of disturbance followed by natural succession. We now know that grass biomes originated millions of years ago, long before humans began deforesting. We present a consensus view from diverse geographic regions on the ecological characteristics needed to identify old-growth grasslands and to distinguish them from recently formed anthropogenic vegetation. If widely adopted, the old-growth grassland concept has the potential to improve scientific understanding, conservation policies, and ecosystem management.

Front Ecol Evol 2015; 1(23): 154–162. doi:10.1093/fec/evv020

Panel 1. Characteristics of many old-growth grasslands, savannas, and woodlands

Ecosystem-level characteristics	Life-history and functional characteristics of old-growth indicator plant species
Species assemblages that do not occur in young, secondary grasslands	Slow growing
High herbaceous-layer plant species diversity	Long-lived
High small-scale (eg 1 m ²) species richness	Strong resprouting capacity
Presence of endemic species	Low success at establishing from seed
Transient seed banks	Poor colonization ability
Persistent bud banks	Investment in underground storage organs
High ratio of herbaceous species to tree species	Clonal growth
High belowground biomass	High root:shoot ratio
Little accumulation of litter or duff	Fire-enhanced or fire-dependent flowering and fruiting
Open, discontinuous tree canopies	Fire-tolerant (thick-barked) trees

What's to love

Diversity - Plants

It's Diverse!

Groundcover Value

Diversity - Plants - Shrubs

Life-history and functional characteristics of old-growth indicator plant species

Slow growing

Long-lived

Strong resprouting capacity

Low success at establishing from seed

Poor colonization ability

Investment in underground storage organs

Clonal growth

High root:shoot ratio

Fire-enhanced or fire-dependent flowering and fruiting

Fire-tolerant (thick-barked) trees

What's to love

Diversity - Animals

Other life depends on the good quality groundcover

Bobwhite Quail, Red-cockaded woodpeckers, Flatwoods salamanders, Florida Grasshopper Sparrows, Meadowlarks, Indigo snakes, Bonneted Bats, Gopher Tortoises,

What's to love

Diversity - Soil & Litter Fungi

11,883 Taxa of Fungi in one North Florida Pine Savanna (OTUs)

What's to love

Complexity

Complexity!

Ancient, complex systems evolved with and are totally dependent upon fire

Part II

Knowing groundcover

What degrades it, what destroys it.....

Recognizing groundcover plants and what they mean....

What our groundcover didn't evolve with.....

*long periods without fire

*soil disturbance, especially
large areas of soil disturbances

These things degrade or destroy old growth
groundcover.

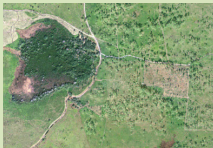
Clearing....



1940 Aerial of area cleared for cattle pens before 1920



100 years and no real
colonization of cleared area
by major old-growth
flatwoods plants



2008 Aerial of same area

Clearing

Destroys OG GC

- Destroy it and it's gone – easy to destroy, not to recover



Many plants do not recolonize disturbed areas
including wiregrass and palmetto and many others
OLD GROWTH GROUNDCOVER INDICATORS

Fire Exclusion

Degrades



Increase of
woody
species,
palmetto,
shrubs and
trees

Budbank

Groundcover degraded
but not gone...

Residual, bud and
seedbank.....



Budbank



Don't underestimate what remains underground after fire exclusion



Easy to reduce shrubs

The Secret - Solutions to woody increase/invasion...

Very frequent burning (less than 3 year interval best) or....

Very frequent mowing and burning (or just mowing) --- will eliminate shrubs if frequency is very high



- Roller chopping has potential for great benefit or catastrophic harm to groundcover.....
- Depends upon how it is used, with high intensity and lots of soil disturbance old growth groundcover species are lost
- What are examples?

Examples

Weedy groundcover



Examples

Bad Groundcover



Gallberry, far as the eye can see.....

Indicator plants

Old Growth Groundcover

Wiregrass
Saw Palmetto
 Indian Grass
 Little Bluestem
 Blueberries & Huckleberries
 100s of other species found in undisturbed groundcover

Weed Field Groundcover

Broomsedge
 Flat topped goldenrod (Euthamia)
 Witchgrass (Dicanthelium)
 Scleria (sedge)
 Other disturbed area species
 Gallberry monocultures

We must manage to preserve, protect and restore old growth groundcover

NOT ratios of shrubs and grasses

We don't want to go from degraded, fire-excluded groundcover to weedy, lost groundcover.

All managers and people who work with restoration and management need to know important groundcover plants and what they mean.

Learning groundcover

End Groundcover
Blindness!



It's fun and easy – you don't need to be an expert

Groundcover blindness – it's completely, (and enjoyably) curable!



Thanks to:

The many land managers who keep burning and learning

protecting and restoring our old-growth groundcover!

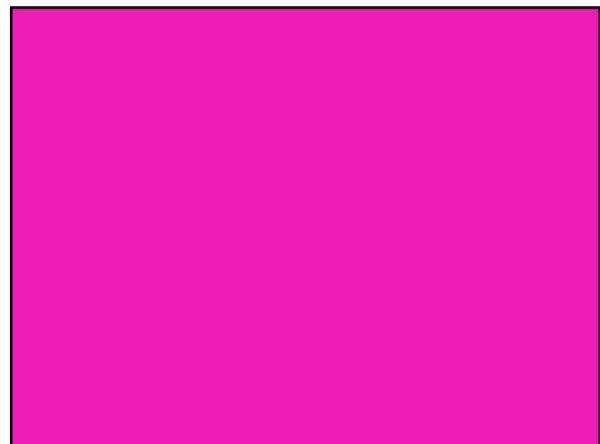


Parts 2 & 3

Unsung heroes of natural areas management and restoration.



Robert Dye and Paula Benshoff enjoying the results of their decades of work and dedication - walking through restored, great condition dry prairie, at Myakka River State Park 2014

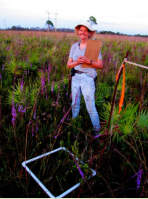


It can be done....

Myakka River State Park



Unsung heroes of natural areas management and restoration.



30,000 acre preserve with management zones that have had a 2.2 year fire interval over past 27 years, all lightning season. They have burned in dry "transition" season with extraordinary restoration results (after 40-year fire exclusion period).