

Summary of Wildlife-Discipline Input on Proposed Action

Kemmerer Grazing and Rangeland Mgt. Project

Don DeLong, 2-20-2018

1. Desired Conditions:
 - a. Plant Species Composition (adjust to meet wildlife objectives)
 - b. Herbaceous Retention for wildlife (add)
2. Utilization Limit (adjust to meet wildlife objectives)
3. More Clarity to a Few Sheep-grazing Practices

1.a. Desired Conditions for Plant Species Composition (to meet wildlife objectives)

- Forest Plan and Other Mgt. Direction
- Wildlife Ecology & Conservation Principles
- Science

Proposed Plant Species Composition

Table 2 - LRMP Desired Future Conditions; Project Specific Desired Conditions, and Related Annual Benchmarks

Resource Area	LRMP future desired conditions, Project Specific Desired Conditions including Long-Term Benchmarks and related Annual Benchmarks
Rangelands including upland and riparian areas; Soils; and Watershed.	- Native and selected non-native species of a moderate to high value for watershed protection will be 60% of the relative cover in all vegetation types grazed by livestock¹. - Effective ground cover at or near potential. Do not allow grazing management activities that will result in >85% of potential effective ground cover for each plant community type grazed by livestock².

This sets a very low bar for wildlife, and does not support Forest Plan direction for wildlife.

- Of 323 grasses, sedges, and forbs rated as M or H for watershed, 30% rated as L for deer and elk.
- Of 235 grasses, sedges, and forbs rated as L watershed 62% and 50% rated as M/H for deer and elk, resp.
- Some species with M / H rating are LTS for many wildlife species.
- Many L-rated species are needed by many wildlife species.

22.1 – Exhibit 01--Continued

GRASS AND GRASSLIKE

R4 Scientific Name

Resource Value Ratings
Cattle YSSFW Sheep YSSFW Horse YSSFW MDeer YSSFW Elk YSSFW E W

<i>Achnatherum nelsonii</i> ssp. <i>dorei</i>	HHHHM	MHMMM	HHHHM	MHMMM	HHHHM	M
<i>Achnatherum pinetorum</i>	M	M	M	H	H	M
<i>Achnatherum scribneri</i>	MNMMLL	MNMMLL	MHMLL	MNMMLL	MHMMML	M
<i>Agropyron cristatum</i>	MHMMM	MHMMM	HHHHH	MHLLM	MHMMM	M
<i>Agropyron smithii</i>	MHMMM	MMLLM	MHMMM	MHLLM	MHMMM	H
<i>Agropyron spicatum</i>	HHMMM	MMLLM	MHMMM	MMLLM	HHMMM	M
<i>Agropyron trachycaulum</i>	MHMMM	MNMMLL	HHHHH	MNMMLL	HHHHH	M
<i>Agrostis exarata</i>	MNMMLL	LMMLL	MHMMM	LMMLL	MHMMML	M
<i>Agrostis idahoensis</i>	MHMLL	LMMLL	MHMMM	LMMLL	LMMLL	M
<i>Agrostis scabra</i>	MHMLL	LMMLL	MNMMLL	LMMLL	MNMMLL	M
<i>Agrostis stolonifera</i>	MNMMLL	LMMLL	MHMMM	LMMLL	MHMMML	M
<i>Agrostis variabilis</i>	MHMLL	LMMLL	MNMMLL	MNMMLL	MNMMLL	M
<i>Alopecurus pratensis</i>	MNMMLL	MNMMLL	MNMMLL	MNMMLL	MNMMLL	M
<i>Andropogon hallii</i>	MNMMLL	MNMMLL	MNMMLL	MNMMLL	MNMMLL	H
<i>Aristida longiseta</i>	LMMLL	LMMLL	MNMMLL	LLLLL	LLLLL	M
<i>Aristida oligantha</i>	LMMLL	LMMLL	LMMLL	LMMLL	LLLLL	L
<i>Aristida purpurea</i>	MNMMLL	LMMLL	MNMMLL	LMMLL	LLLLL	L
<i>Aristida purpurea</i> var. <i>fendleriana</i>	LMMLL	LMMLL	LMMLL	LLLLL	LLLLL	M
<i>Arrhenatherum elatius</i>	MNMMLL	MNMMLL	MNMMLL	MNMMLL	MNMMLL	M
<i>Avena fatua</i>	MHM-M	MHL-M	MHM-M	LML-L	LML-L	L

R4 Co

Dore's pine n
Scribn
crested
western
bluebu
slender
spike k
Idaho
rough
creepin
mount
meado
sand b
Fendle
prairie
purple
Fendle
tall oat
wild o

Suitable Species Composition for Forbland Communities

- Canopy cover of herbaceous vegetation is at 50-100% (drier to moister sites)
- At least 60% of the total vegetation canopy cover must be comprised of species representative of forbland communities:

Forb species representative of forb community types or are widespread across types^A

fernleaf ligusticum^{B,C,D,E,F,H}

nettle leaf giant hyssop^{B,D,E}

thickleaf groundsel^{B,D,E}

tall larkspur^{B,C,D,E,F}

western coneflower^{B,D,E,J}

peregrine fleabane^B

silvery lupine^{B,D,E,F}

blue stickseed^{B,D,E}

leafbract aster^{B,D,E,F}

western sweetroot^{B,D,E,F}

meadow rue^{B,D,E,F}

thickstem aster^B

western valerian^{B,D,E,F,H,I}

fernleaf lousewort^{B,D}

Englemann aster^{B,D}

sticky geranium^{B,C,D,E,F,H,I}

Forbs representative of small number of forb comm. types & not widespread across types^G although some can occur in communities with high diversity (represented by above species)

edible valerian^{B,C,D,F,I}

elkslip marsh marigold^B

cow parsnip^{B,D,E,F}

one-flower helianthella^{B,C,D,E,F}

mountain bluebells^{B,D,E,F}

California false hellebore^{B,E}

arrowleaf balsamroot^{B,E}

Canada goldenrod^{B,D}

long-leaf arnica^{B,E}

cutleaf balsamroot^B

Grasses representative of forb communities

mountain brome^{B,C,D,H}

slender wheatgrass^{D,H}

hood sedge^{E,F,H}

purple oniongrass^D

Raynold's sedge^{D,E,F,H}

small-winged sedge

- Canopy cover of mule ears, western coneflower, Louisiana sagewort, cutleaf balsamroot, orange sneezeweed, bicolor biscuitroot, and northwest cinquefoil must be each be less than 5-10%, except for a small proportion of the total forbland acreage*

- 1.a. Desired Conditions for Plant Species Composition (to meet wildlife objectives)
2. Utilization Limit (adjust to meet wildlife objectives)

Fundamental principle of wildlife habitat conservation

What is the most fundamental part of sustaining the full array of native wildlife species in an area?

HABITAT

More specifically:

An adequate amount of suitable habitat.

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Two Key parts of this:

1. What is produced (range and riparian health)
2. What is retained (herbaceous retention & utilization)

Management Direction

Forest Plan Objectives

- 2.1(a) — Provide *suitable & adequate* habitat for **game and fish** populations.
- 3.3(a) — Protect **sensitive species** & provide *suitable and adequate amounts* of habitat to ensure that activities do not cause: (1) long-term or further decline in population numbers or habitats supporting these populations; or (2) trends toward federal listing.
- 4.7(a) — Retain *suitable and adequate amounts* of **wildlife** forage and cover

DFC Direction

Conflicts between FP objectives are resolved by application of DFCs (*pages 93 and 145 of FP*).

DFC 10 (51% of K-17) — Management emphasis = “...to provide long-term and short-term habitat to meet the needs of wildlife managed in balance with... livestock grazing...”

DFC 12 (36% of K-17) — Management emphasis = “...providing such important habitat for big-game as winter ranges, feedgrounds, calving areas, and security areas...”

Management Direction

Migratory Bird Requirements (e.g., EO 13196 and MOU)

“Protect, restore, and conserve habitat for [migratory birds](#), addressing the responsibilities of Executive Order 13186...”

“Pursue opportunities to restore or enhance the composition, structure, and juxtaposition of migratory bird habitat...” to the extent practicable.

“Design and integrate migratory bird habitat and population conservation principles, measures, and practices into... rangeland planning...”

Examples:

- Manage for native plants. Different species host diff. insects, providing food for a variety of bird species.
- Maintain small mammal (esp. vole) and insect populations as prey for many bird species.
- Where possible, restore or rehabilitate degraded and disturbed sites to native plant communities.
- Maintain herbaceous cover for nest concealment.
- Ensure adequate residual vegetation cover is left after grazing.

Upshot (for herb retention)

Retain an adequate amount of suitable forage and cover for native ungulates, sensitive species, migratory birds, and other wildlife on allotments.

Two Key Parts of “Adequate Amount” of “Suitable” Habitat

1. Sustain the capacity of the land to produce habitat.

Most important:

- Ground cover
- Plant species composition



**Forest Plan Direction
for Range, Riparian,
and Wildlife**

2. Retain an adequate amount of suitable forage and cover for wildlife.

Forage Utilization Standard:

During AMP revision, prescribe site-specific utilization levels needed to meet Forest Plan objectives.

Establish site-specific utilization levels on key wildlife ranges.

Also... “Chapter 90” (FSH) calls for developing allowable-use limits to achieve Forest Plan objectives.

Applicable Forest Plan Objectives:

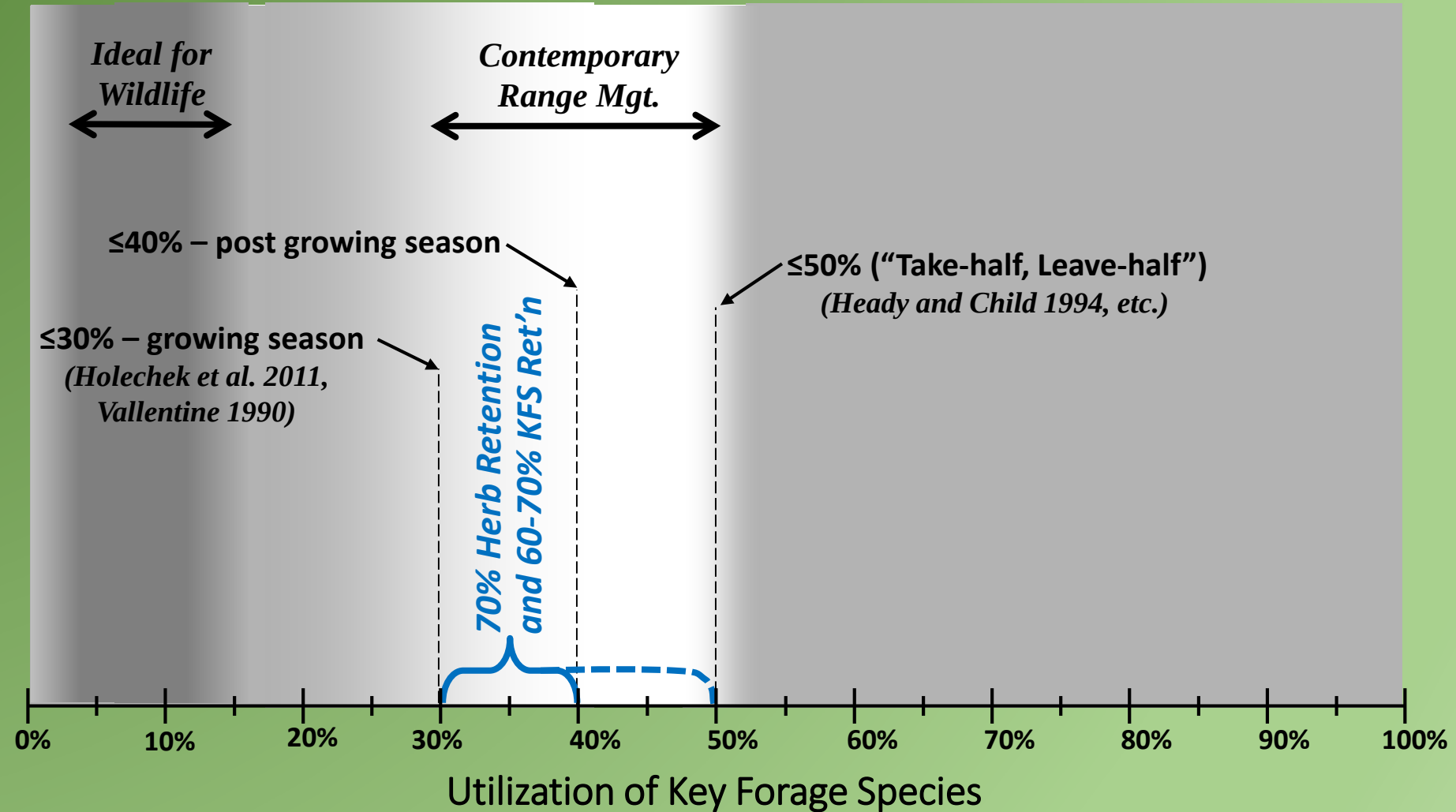
Objective 2.1(a) Provide suitable and adequate habitat to

Upshot

Retain an **adequate amount** of **suitable** forage and cover for native ungulates, sensitive species, migratory birds, and other wildlife on allotments.

Objective 2.1(a) Retain an adequate amount of suitable forage and cover for wildlife.

Some Perspective (Multiple Use & 'Balance'):

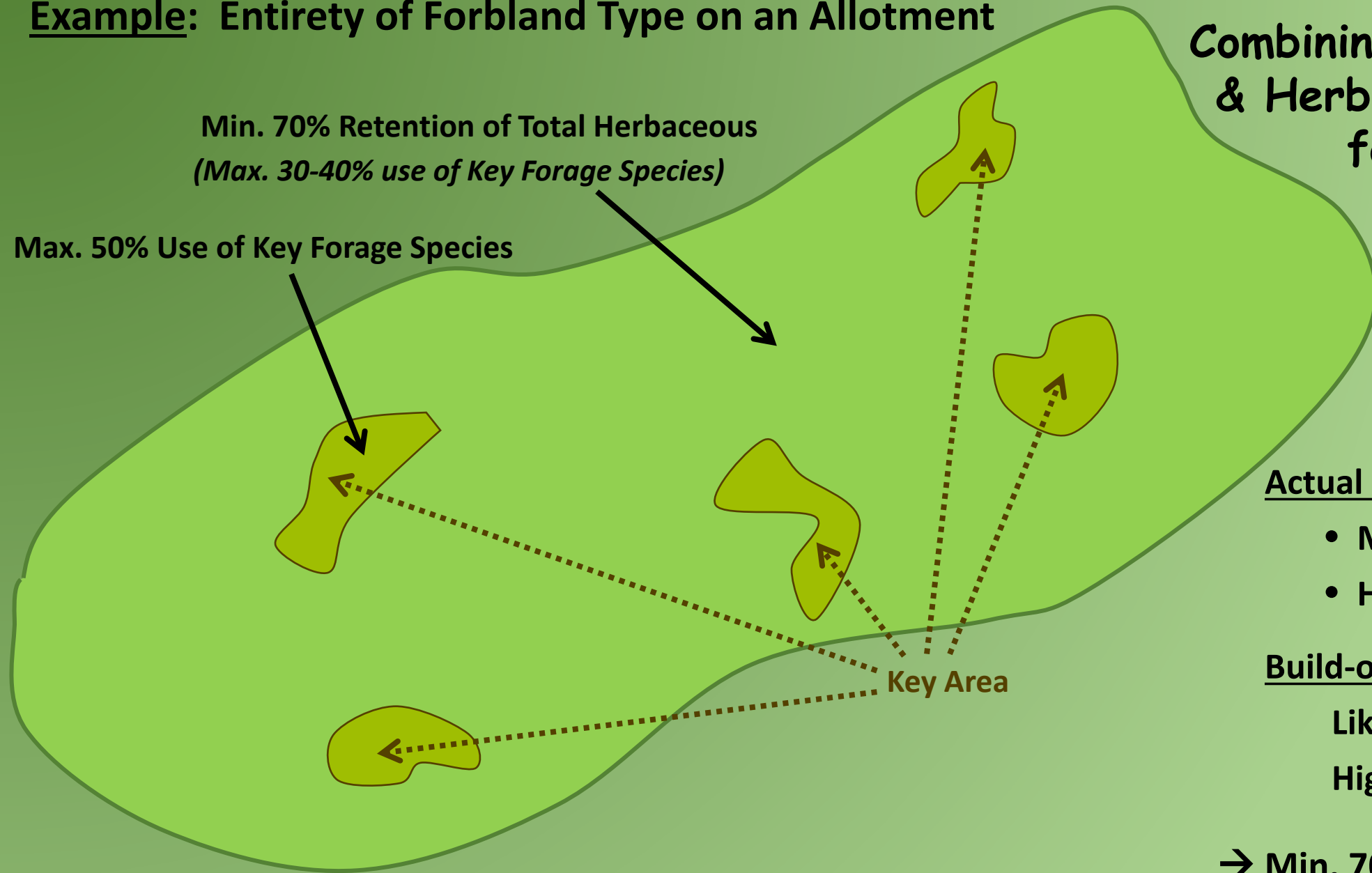


Example: Entirety of Forbland Type on an Allotment

Combining Utilization Limit & Herbaceous Retention for Wildlife

Min. 70% Retention of Total Herbaceous
(Max. 30-40% use of Key Forage Species)

Max. 50% Use of Key Forage Species



Actual Use in Key Areas:

- Mostly <30%*
- Highest = 36%*

Build-out of Permits:

Likely to mostly be <30%*
Highest easily under 50%*

→ Min. 70% herb retention
across $\geq 80\%$ of area easily met

* Based on measured actual-use in 2016 and 2017

Adjustments to Proposed Action to Allow FP Objectives to be Met for Wildlife

Rangelands or Plant Communities in Satisfactory Condition: Maximum forage utilization 50% of key species at key areas on uplands, aspen, and riparian areas away from the greenline in order to meet desired conditions desired conditions for vegetation and ground cover (over the long term) and for herbaceous retention (in short term).

Desired Condition for Herbaceous Retention for Wildlife:

A minimum of 70% of the annual production of all herbaceous vegetation is retained across $\geq 80\%$ of each major vegetation-type grouping* within each allotment.

A minimum of 60-70% of the annual production of key forage species is retained across $\geq 80\%$ of each major vegetation-type grouping* within each allotment.

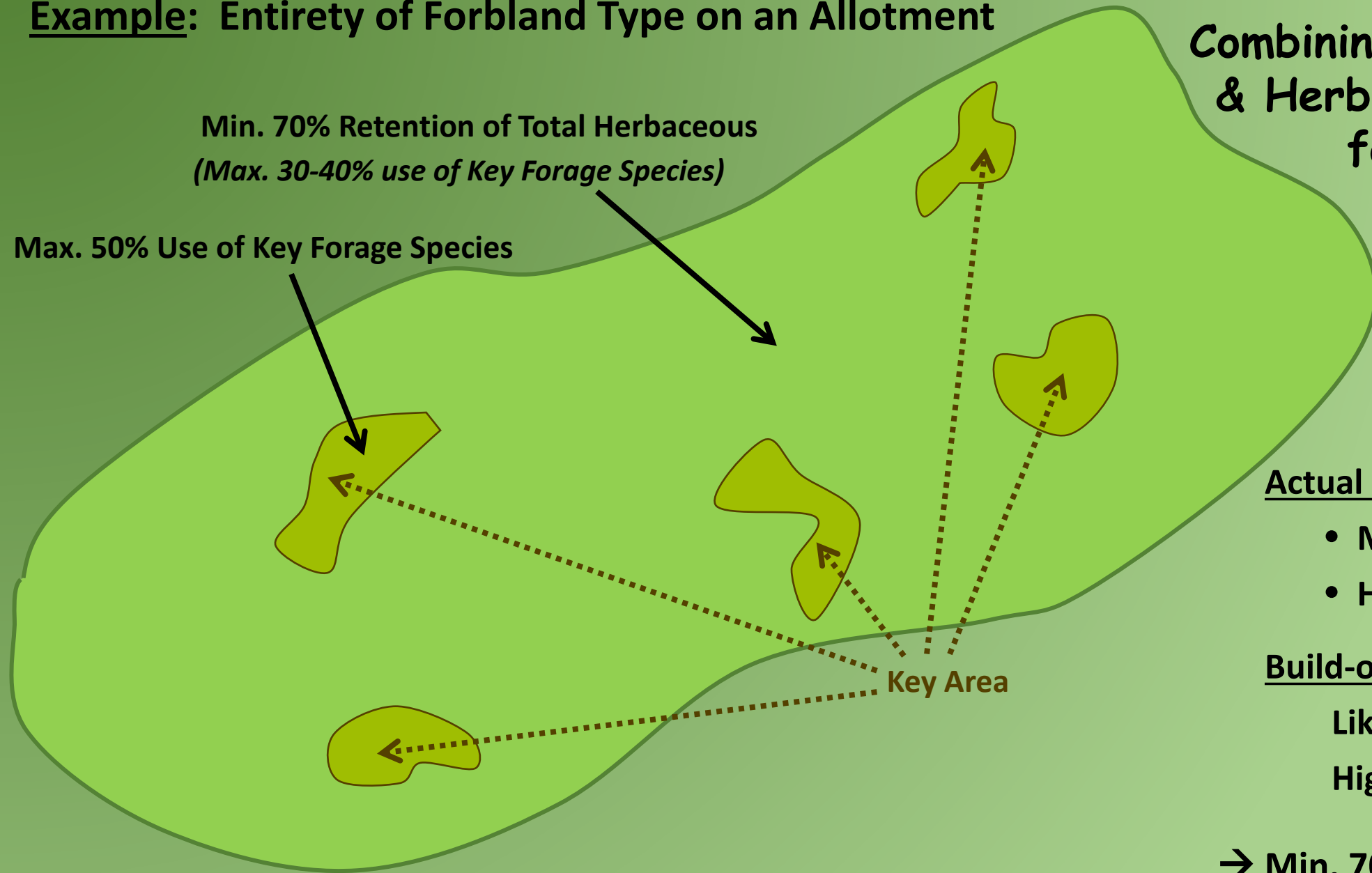
* (1) big sagebrush/mountain shrubland, (2) aspen/open forestland, (3) forbland communities (minus mule ears, sagewort, tarweed sites); (4) moist meadow/silver sagebrush/shrubby cinquefoil; (5) wetland/wet meadow, and (6) willow-herb communities

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Brief Summary of Science Supporting 70% Herbaceous Retention for Wildlife

(If Needed)

For 5 sets of species:

- Mule Deer and Elk
- Nesting Birds
- Voles, as prey
- Invertebrates (e.g., as prey, pollinators)
- Amphibians

Max. Use to Meet Needs of Big Game

Authored by 14 State Wildlife Biologists in 7 Western States
(including from Wyoming Game and Fish Dept.)

HABITAT GUIDELINES FOR MULE DEER INTERMOUNTAIN WEST ECOREGION

REPRESENTATIVE VEGETATION TYPES	ANNUAL PRECIPITATION (IN.)	UTILIZATION MAXIMUM ON POOR RANGES OR RANGES GRAZED IN GROWING SEASON (%)*	UTILIZATION MAXIMUM ON GOOD RANGES GRAZED IN DORMANT SEASON (%)
LOW SAGE	< 12	25	35
PINYON-JUNIPER, MAHOGANY	10-21	30	40
BITTERBRUSH, SNOWBRUSH, SNOWBERRY, MOUNTAIN BIG SAGE, MIXED CONIFER	16-50	30	40

~ Min. 70% herb retention

Elk → Max. 40% use of key forage (Wisdom and Thomas 1996,
and Dr. James Peek, pers. comm. 2008)

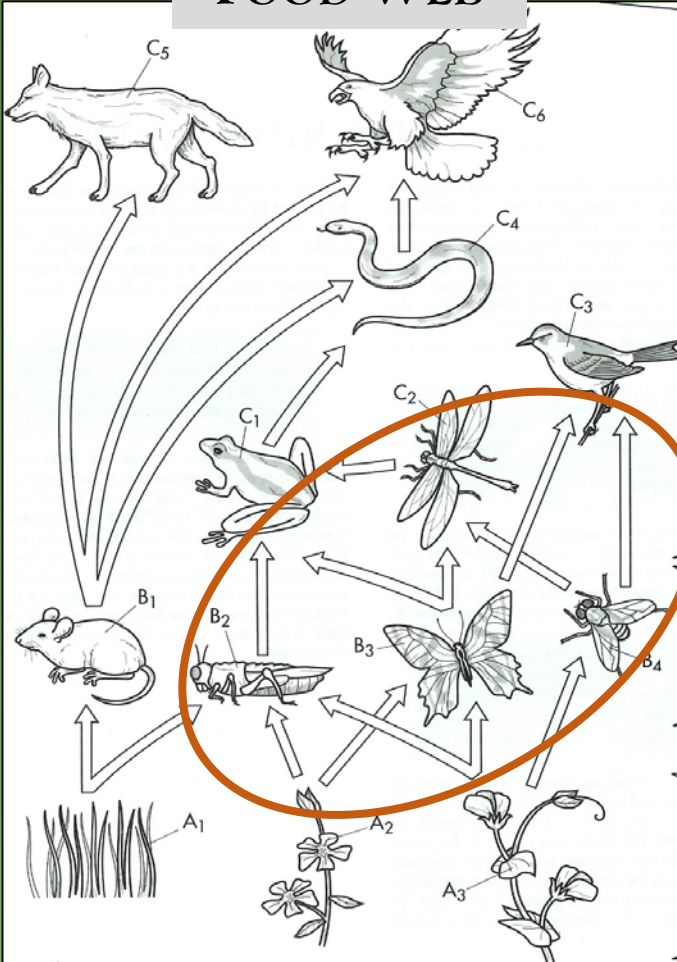
No science or recommendations supporting max. 50% use of key forage

A Product of the
Mule Deer Working Group
Sponsored by the
Western Association of Fish and Wildlife Agencies

2009

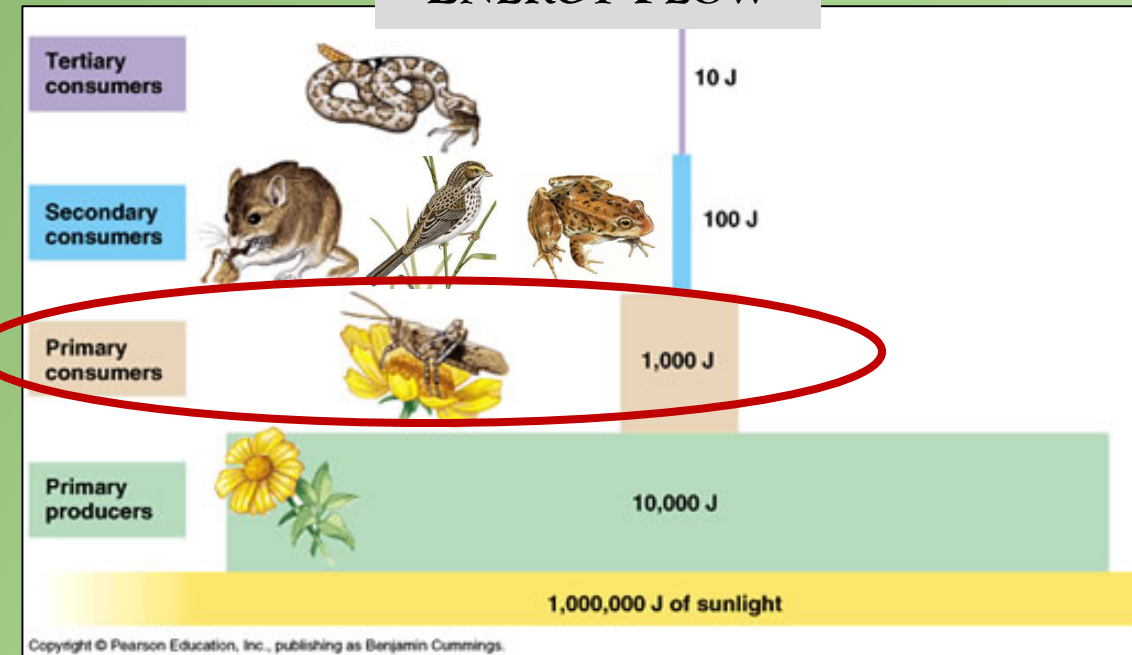
Invertebrates — Importance & Effects of Grazing

FOOD WEB



- Food for:
 - Many species of Migratory Birds
 - Bats
 - Shrews
 - Amphibians and Reptiles
 - Many species of Predatory Invertebrates
- Pollination
 - Bees
 - Butterflies
 - Flies
 - Beetles
- Decomposition / Cycling
- Soil aeration
- Bio-control

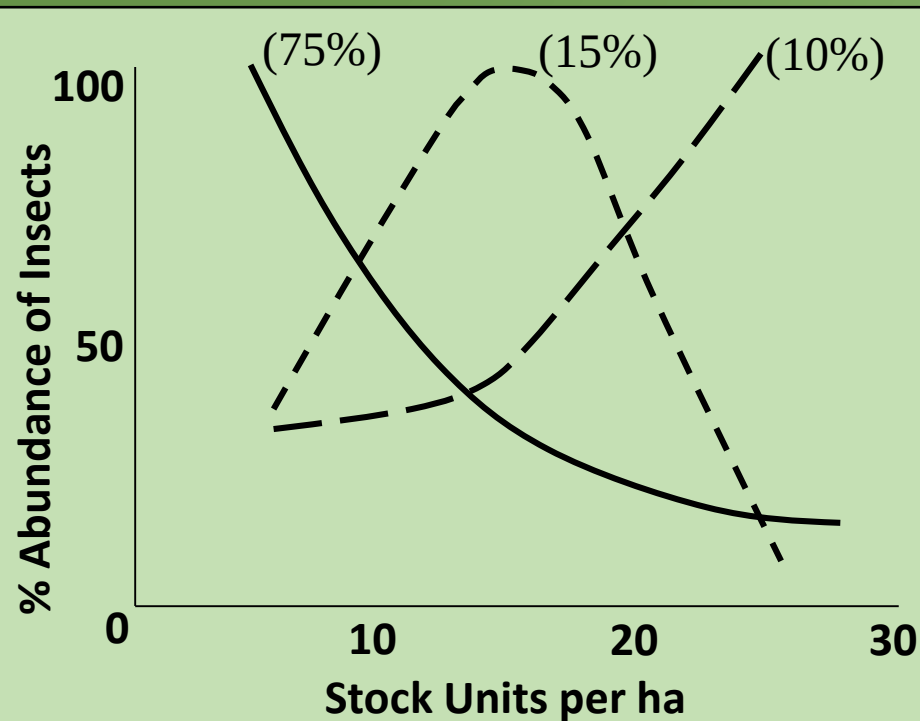
ENERGY FLOW



Invertebrates — Importance & Effects of Grazing

General Rule — as herbaceous height and veg. density decline, most invertebrate species decline.

Research results are consistent across many taxa and guilds



**Insects in meadow communities
(% of families and species).**

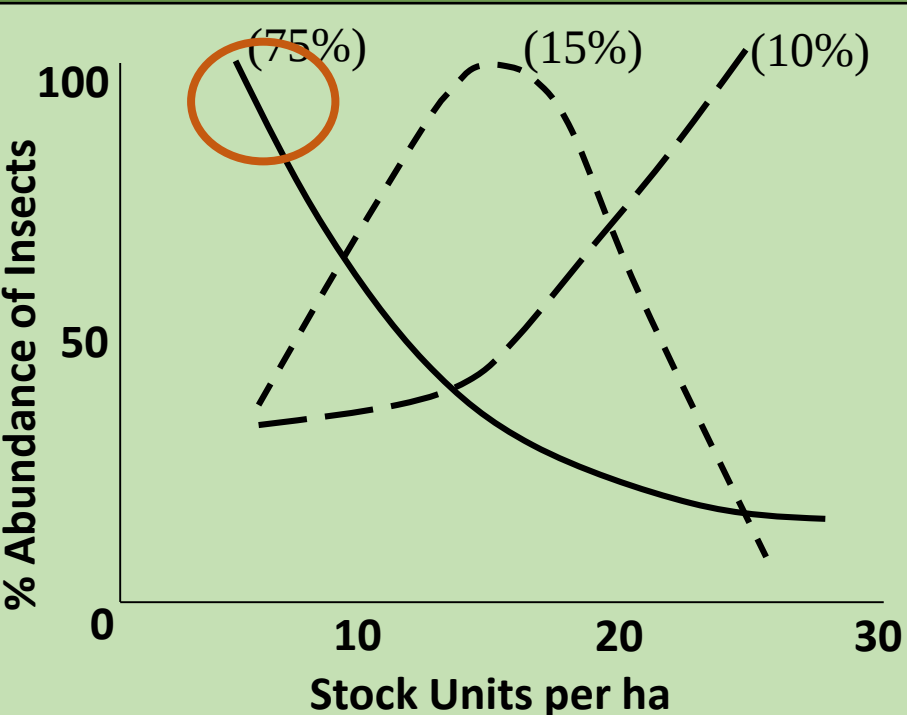
From East and Pottinger (1983)

- Moths and Butterflies
- Bees
- Beetles
- Leafhoppers and Planthoppers
- Cicadas
- True Bugs
- Grasshopper (many species)
- Flies
- Dragonflies and Damselflies
- Millipedes and Centipedes
- Leaf Miners
- Parasitic Wasps and Bees
- Foliar Arthropods in general
- Seed Predators, Stem Borers, Gall Makers, and Sap Suckers
- Roundworms and Springtails
- Spiders

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- Foliar Arthropods in
- Seed Predators, Ste
- Gall Makers, and Sa
- Roundworms and S
- Spiders

Some of the Supporting Science:

Luff (1966),	Morris (1967),
Morris (1971),	Delchek and Kajak (1974)
King and Huthinson (1976)	Hawkins et al. (1979)
Hutchinson and King (1980)	Morris (1983)
Morris and Plant (1983)	Sugden (1985)
Welch et al. (1991)	Gibson et al. (1992)
Sterling et al. (1992)	Bell et al. (2001)
Kruess and Tschardt (2002)	Vazquez and Simberloff (2003)
Ringwood et al. (2004)	Foote and Hornung (2005)
Samways (2005)	Nat'l Res. Council (2005)
DeBano (2006)	Batary et al. (2007)
Gomez and Gonzales (2007)	Wallis et al. (2007)
Dennis et al. (2008)	Littlewood (2008)
Gardiner and Hassel (2009)	New (2009)

The threshold for declines appears to be about 80-85% herbaceous retention.

East and Pottinger (1983), Foote and Hornung (2005), Kimoto et al. (2012), van Klink et al. (2015), Evans et al. (2015)

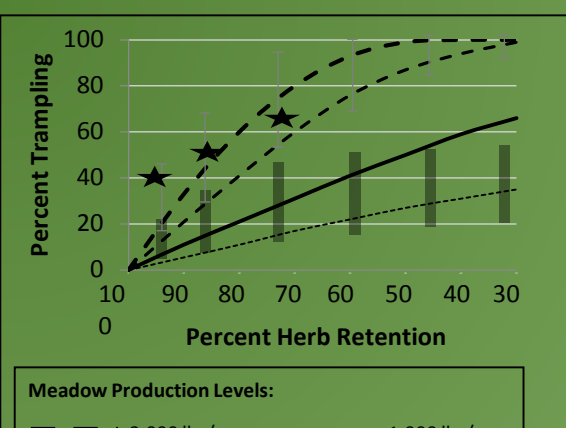


Figure 6.a. Estimates of the percent of small stationary objects (as simulated ground nests) trampled at different levels of total herbaceous utilization in meadows of different production levels during a 4-week period. See text for more detail. (see DeLong 2016 for development)

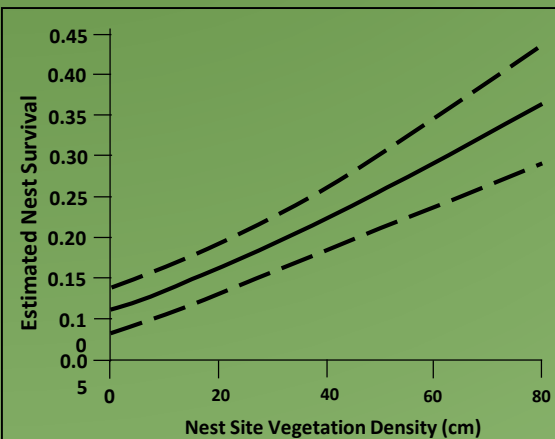


Figure 6.b. Adapted from Bloom et al. (2013:Figure 2e). Relationship between estimated waterfowl nest survival ($\pm 85\%$ CIs) and nest-site vegetation density in the Canadian Prairie Pothole Region, 2002-2009.

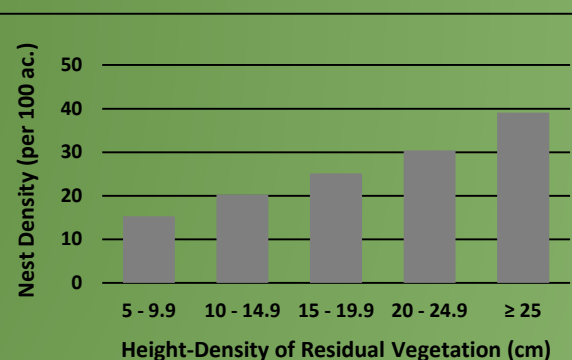


Figure 6.c. Adapted from Kirsch et al. (1978:Table 1). Relationship between height-density of residual vegetation and nest density of 697 nests.

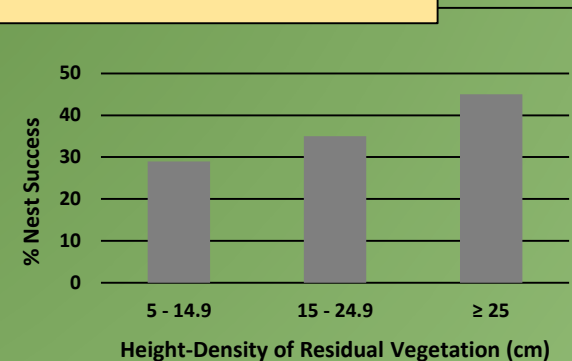
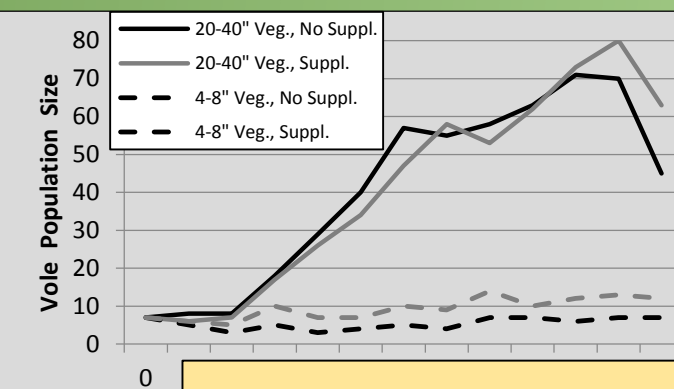
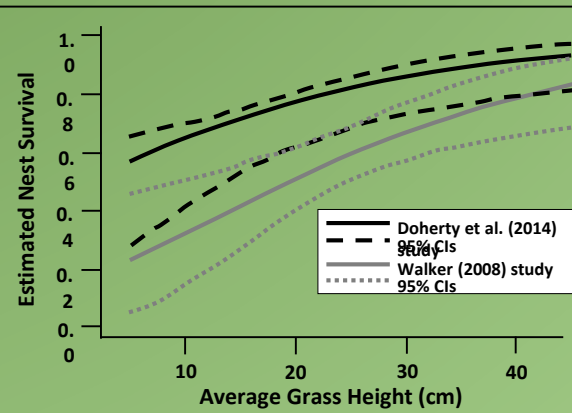


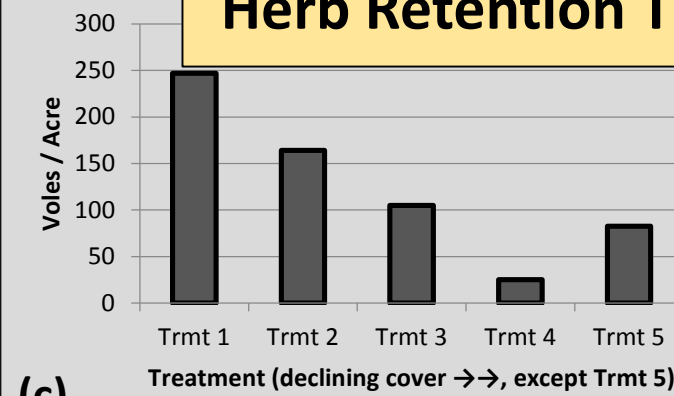
Figure 6.d. Adapted from Kirsch et al. (1978:Table 2). Relationship between height-density of residual vegetation and nest success of 573 duck nests. Height-density was determined with a Robel pole.



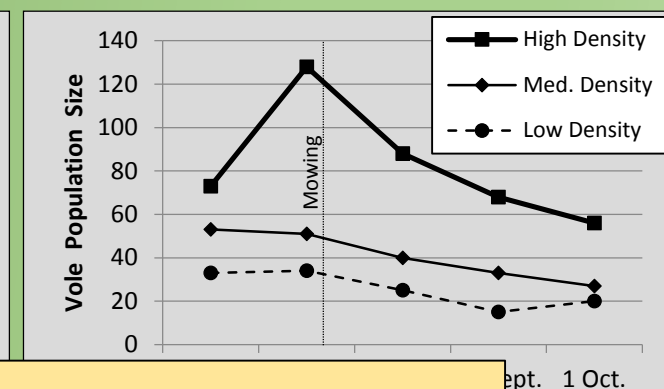
(a)

Effects on Voles

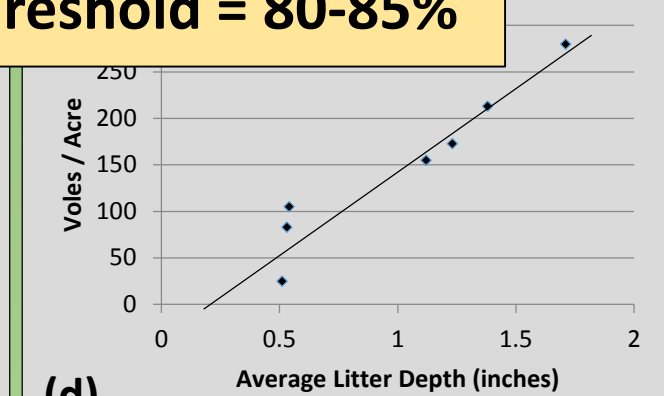
Herb Retention Threshold = 80-85%



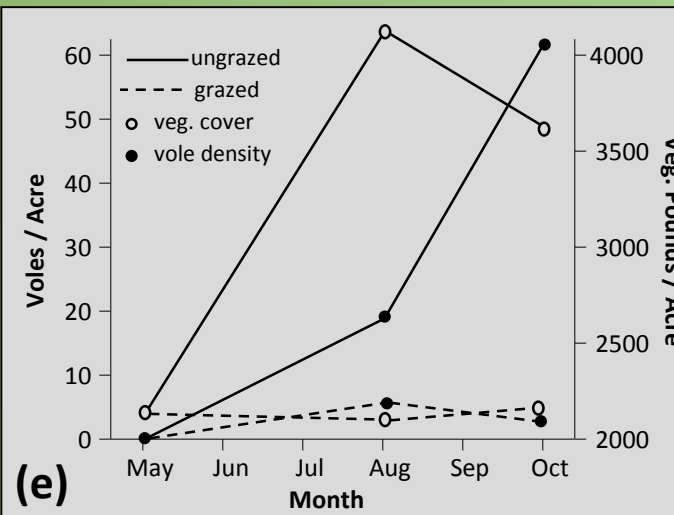
(c)



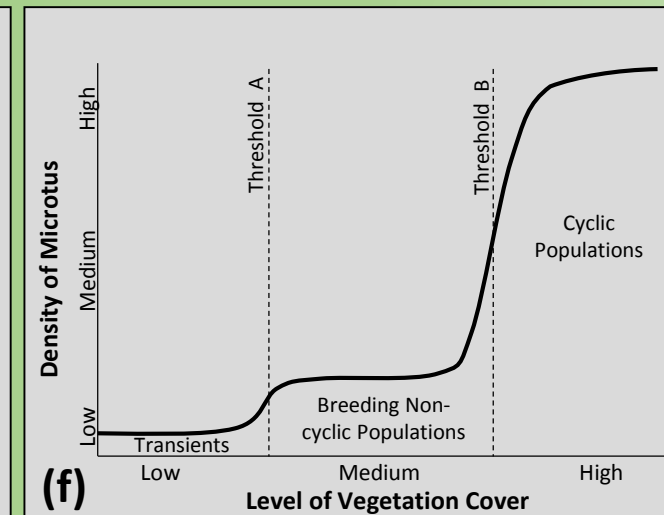
(d)



(d)

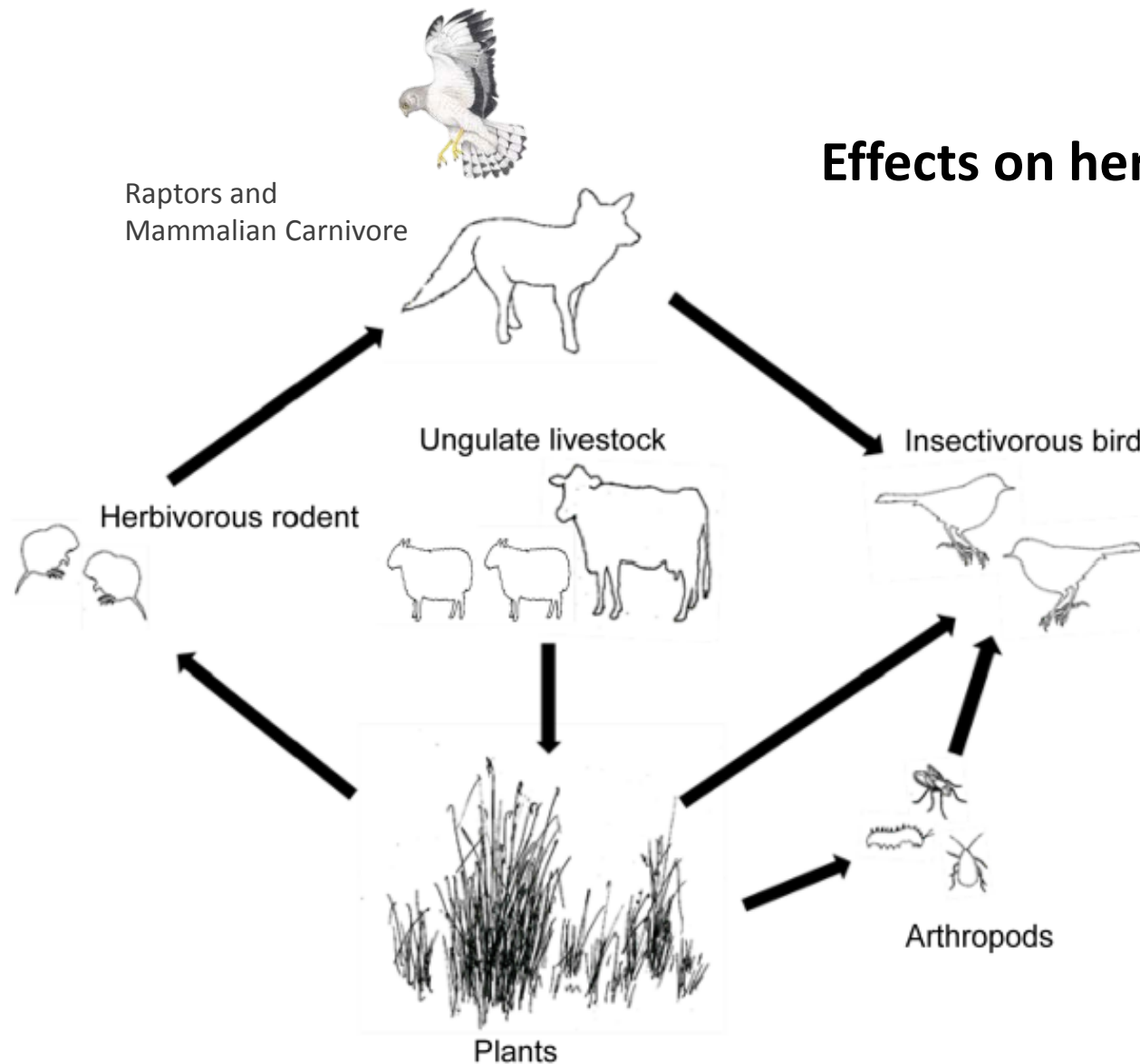


(e)



(f)

Landscape Level Studies Involving Several Trophic Levels



Effects on herb veg → voles & insects → raptors and foxes

Mid-Point

65%

78%

70%

70%

Effect thresholds (estimated herbaceous retention)

55-75% - Johnson and Horn (2008)

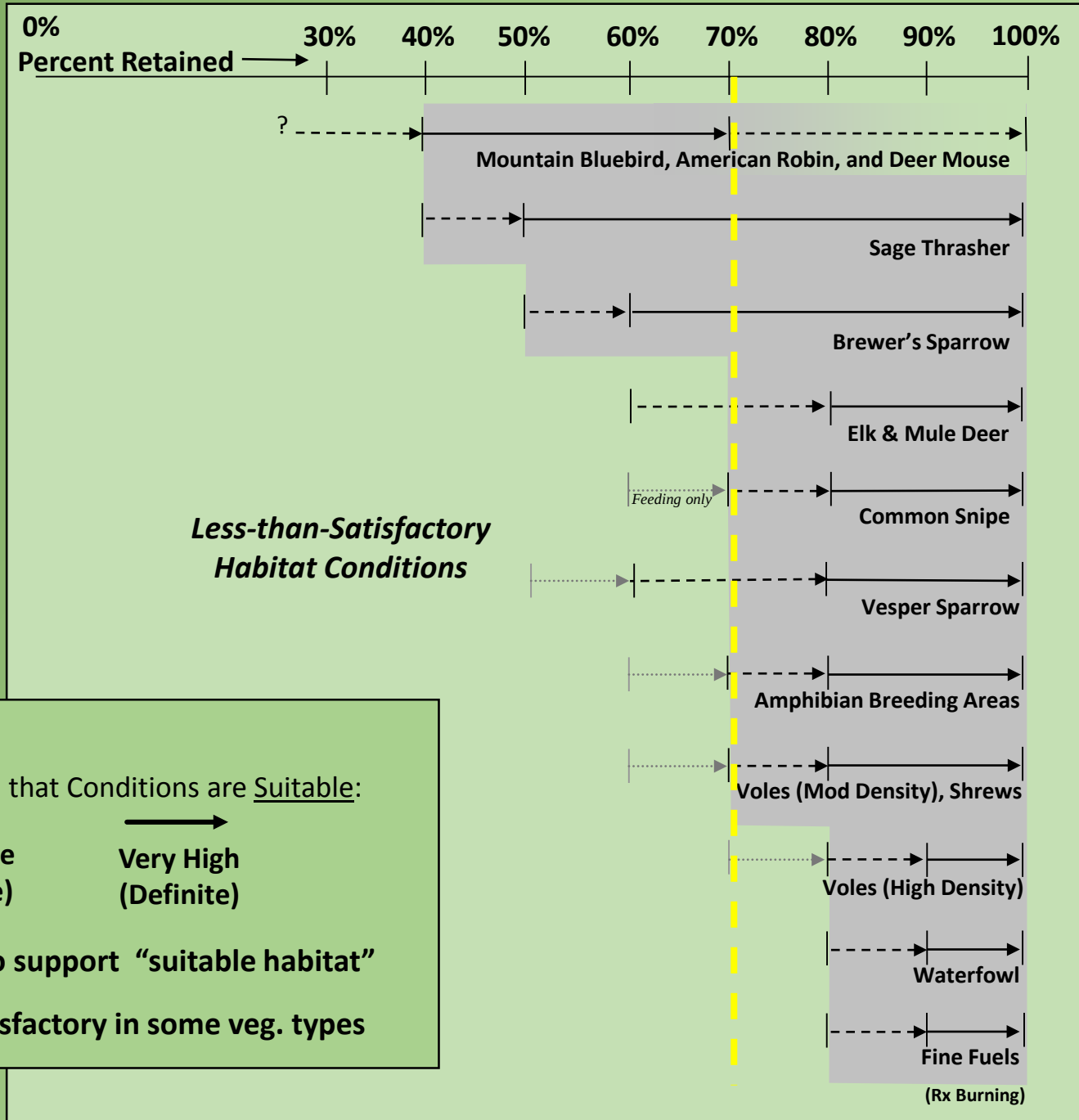
70-85% - Wheeler (2008)

60-80% - Villar et al. (2013)

60-80% - Evans et al. (2015)

Summary of Wildlife Herb Retention Needs

— Range of Small Number of Species —



Legend

Level of Confidence in Making Conclusion that Conditions are Suitable:

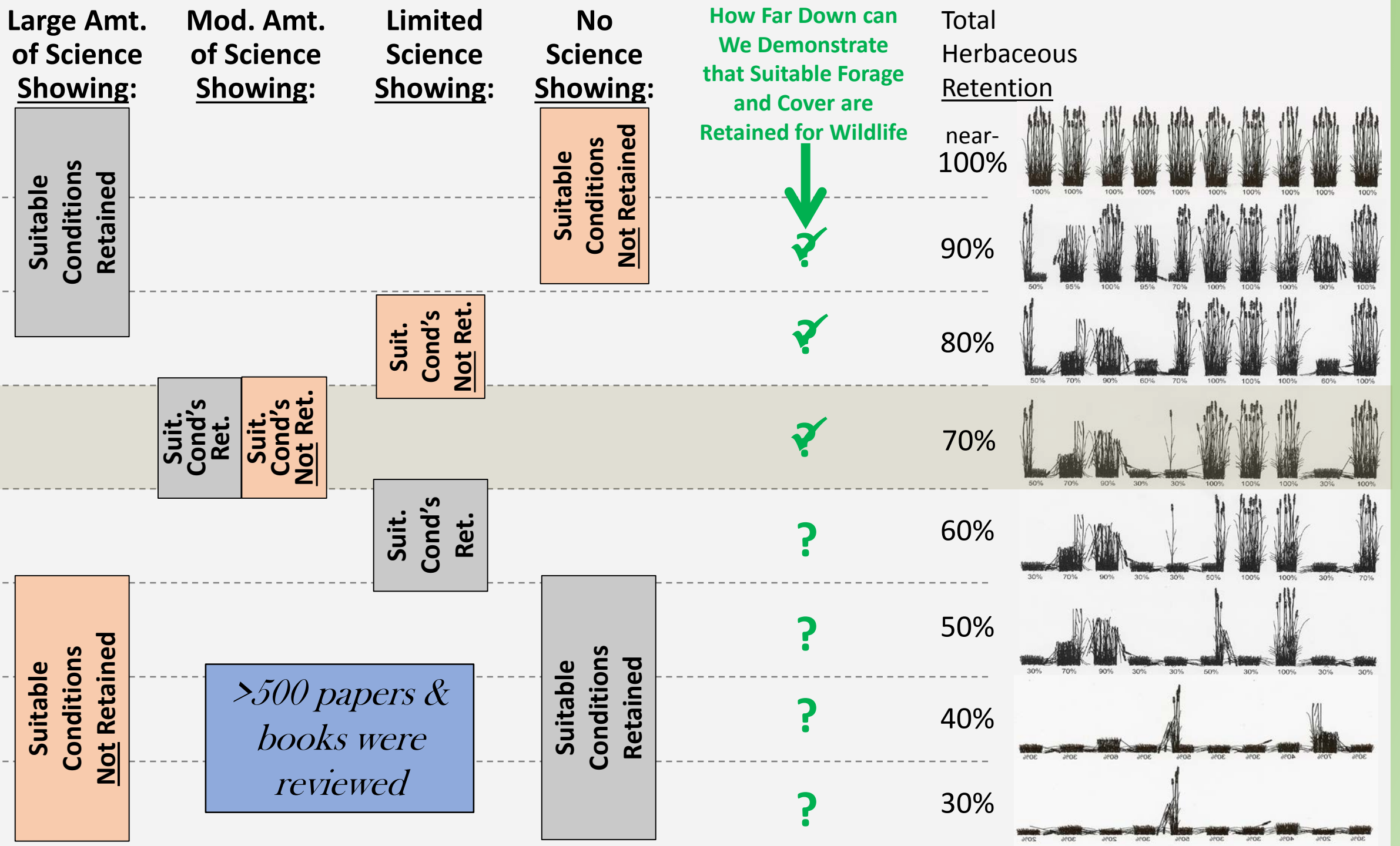
.....→ - - - -> —————→

Low Moderate Very High

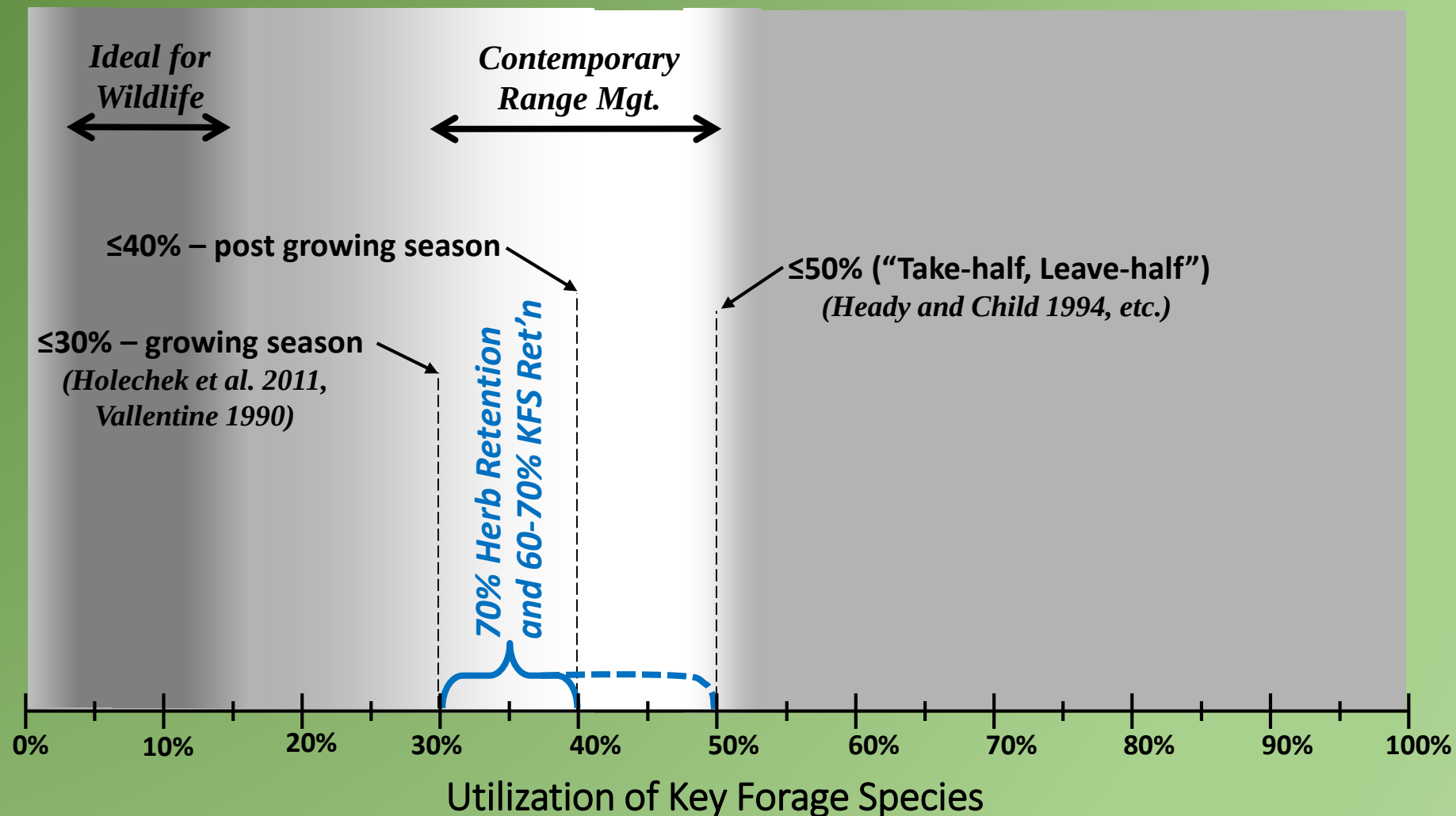
(Improbable) (Possible) (Definite)

 = Sufficient info. is available to support “suitable habitat”

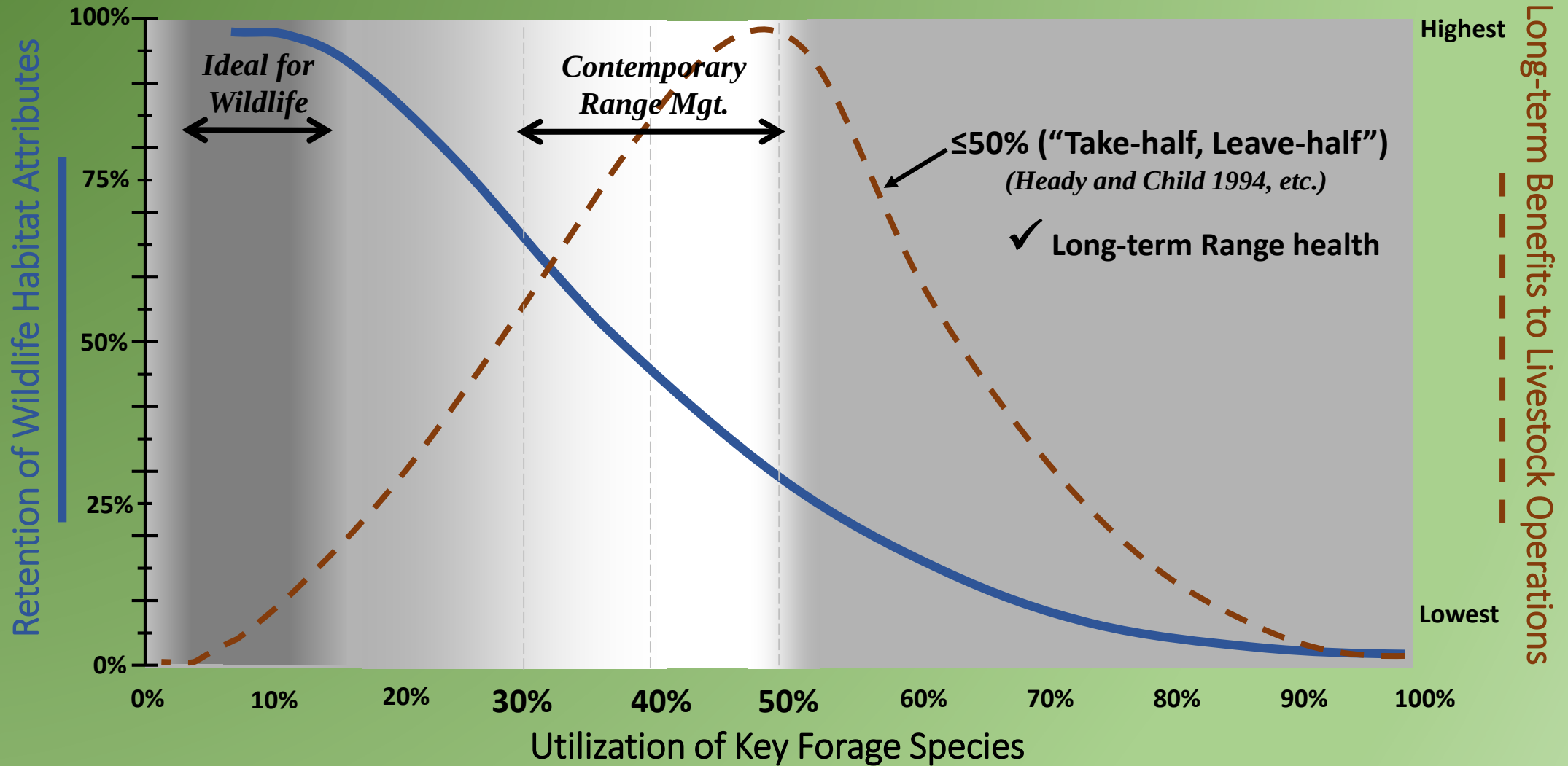
 = Gradation into less-than-satisfactory in some veg. types



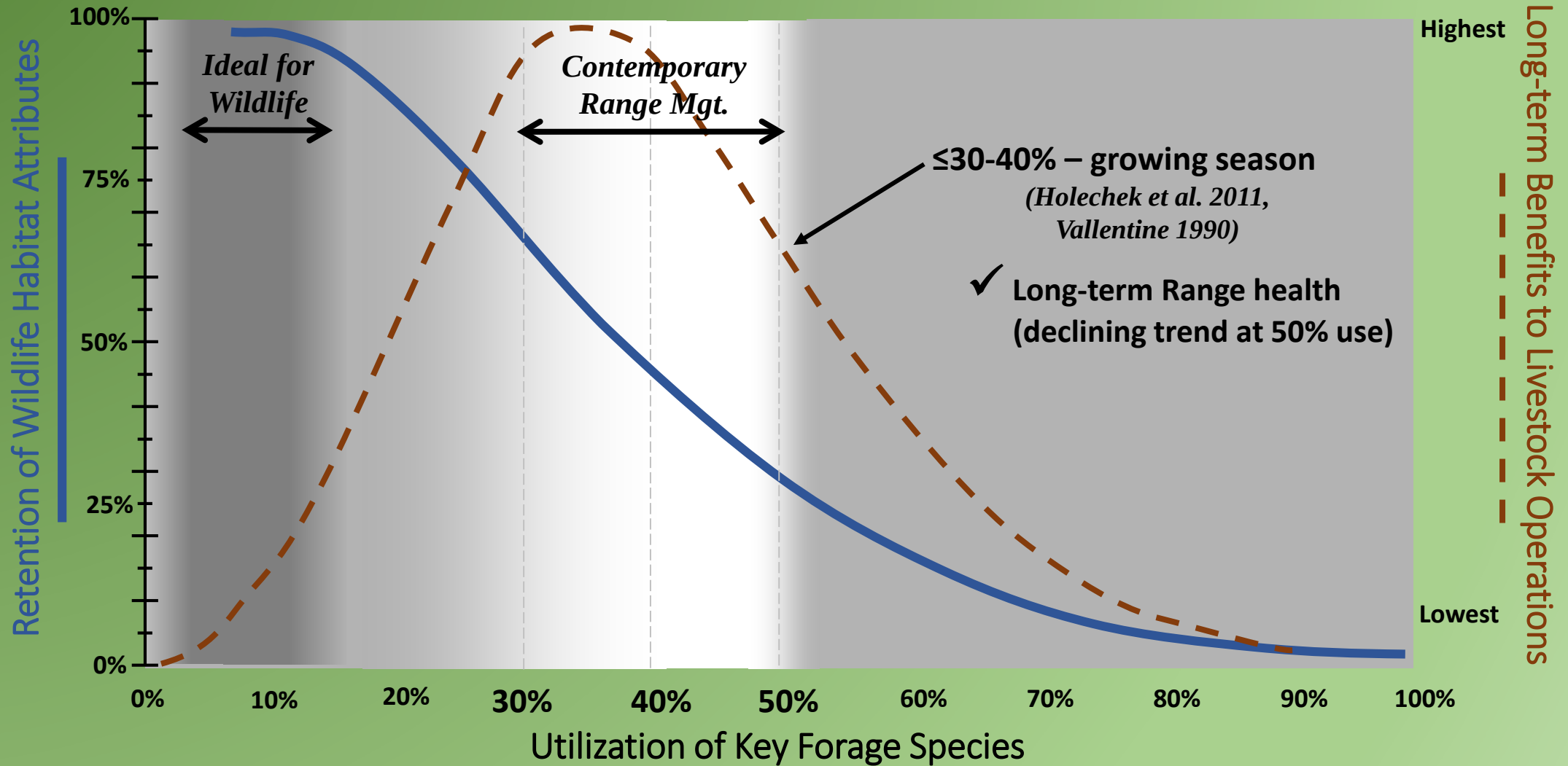
Some Perspective (Multiple Use & 'Balance'):



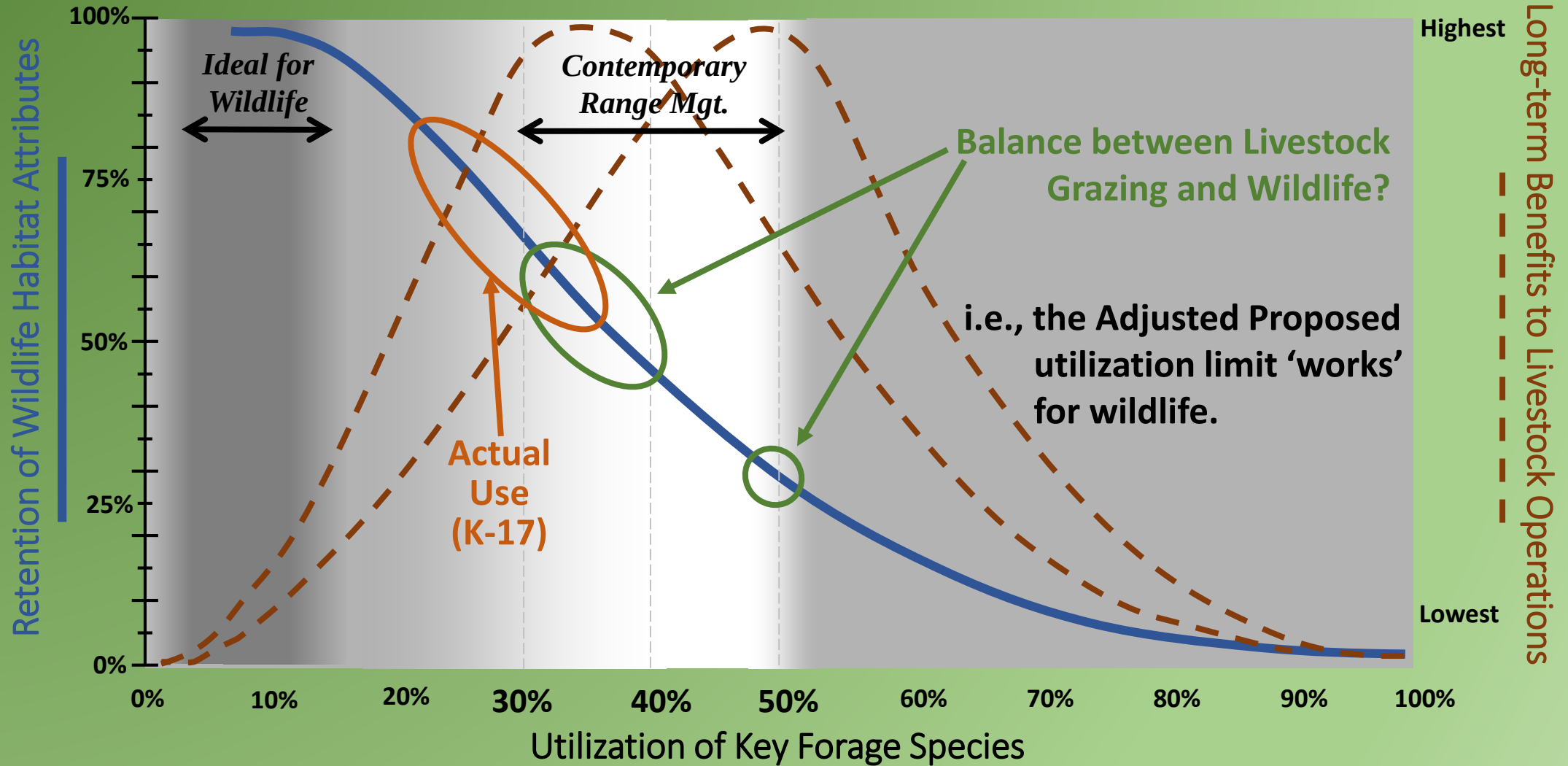
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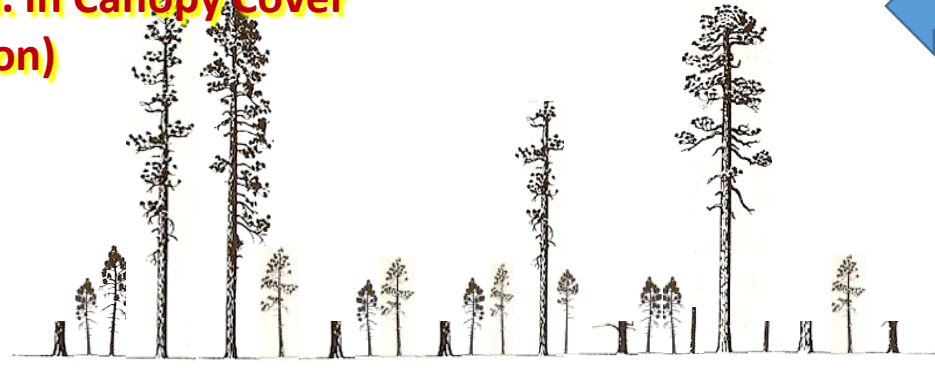
Some Perspective (Multiple Use & 'Balance'):



**90% Canopy Cover
(Capacity)**



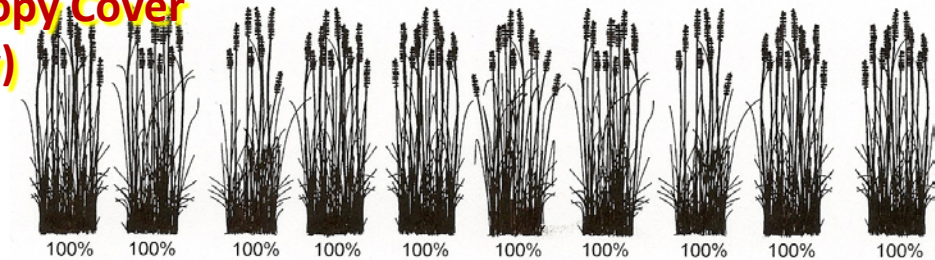
**73% Red. in Canopy Cover
(Retention)**



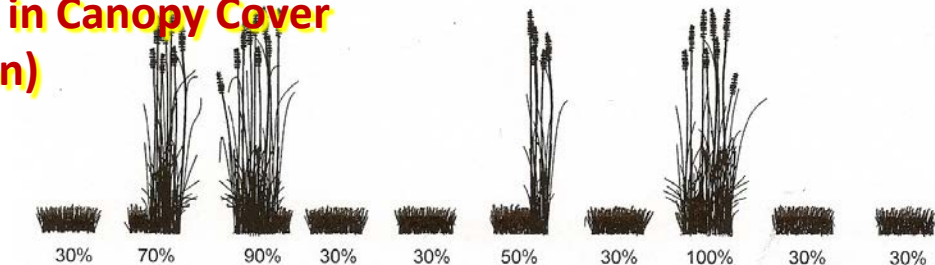
**Veg. Structure (e.g., canopy cover)
Harvest Level are:**

- Interconnected
- Key Elements Shaping Wildlife Habitat

**90% Canopy Cover
(Capacity)**



**76% Red. in Canopy Cover
(Retention)**



Vertical Biophysical Layers in Meadow Habitat



Upper layers provide forage (leaves, seeds, and invertebrates)...

And drive conditions in the lower layers, including litter layer.

Upper Layer

- Fully exposed to ambient climate
- High light, virtually no shade
- Low Visual Obstruction
- Abundance of Flower and Seed Forage
- Species composition fully realized
- Abundance of Substrate

Middle Layer

- Moderate humidity, little wind
- Somewhat moderated temperatures
- Reduced light, moderate shade
- Moderately high visual obstruction
- Meets behavioral attachment to dense overhead canopy
- High diversity of forage and substrate types
- Abundance of leaf forage and substrate

Lower Layer

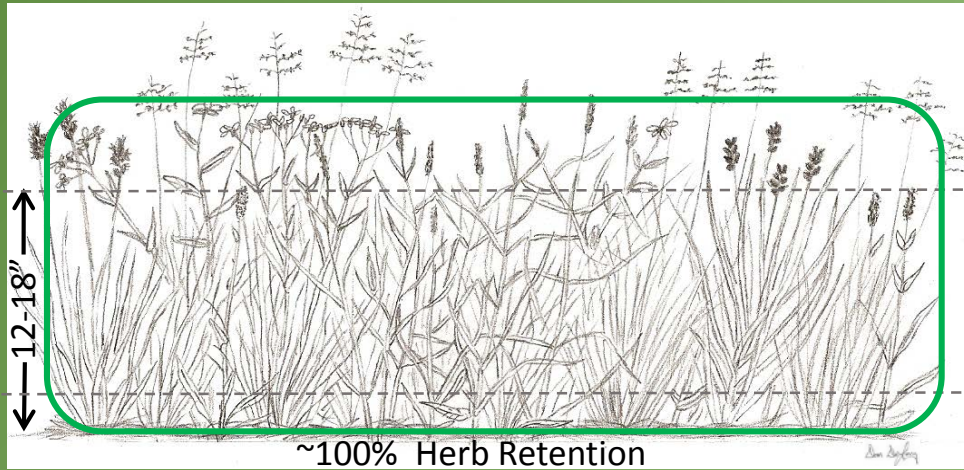
- High humidity, moderated temperature
- No wind
- Deep shade, little light
- High visual obstruction
- Some basal leaf forage

Ground / Litter Layer

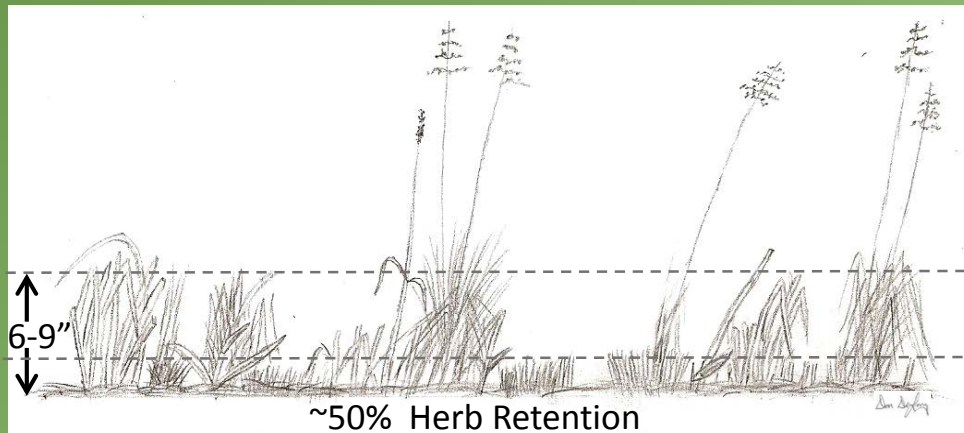
- Well developed, e.g., relatively deep
- High moisture retention
- Numerous spaces between plant material

Upper Soil Layer

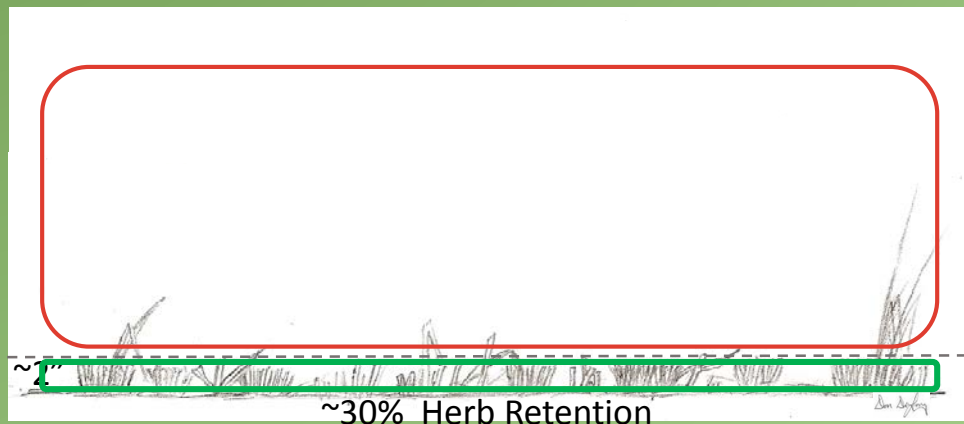
- High organic content
- Loose soil structure
- High moisture retention
- Temperature moderation



- Upper
- Middle
- Lower



- Upper
- Middle
- Lower



- Upper
- Middle
- Lower

Desired Conditions for Plant Species Composition

Similarity to PNC

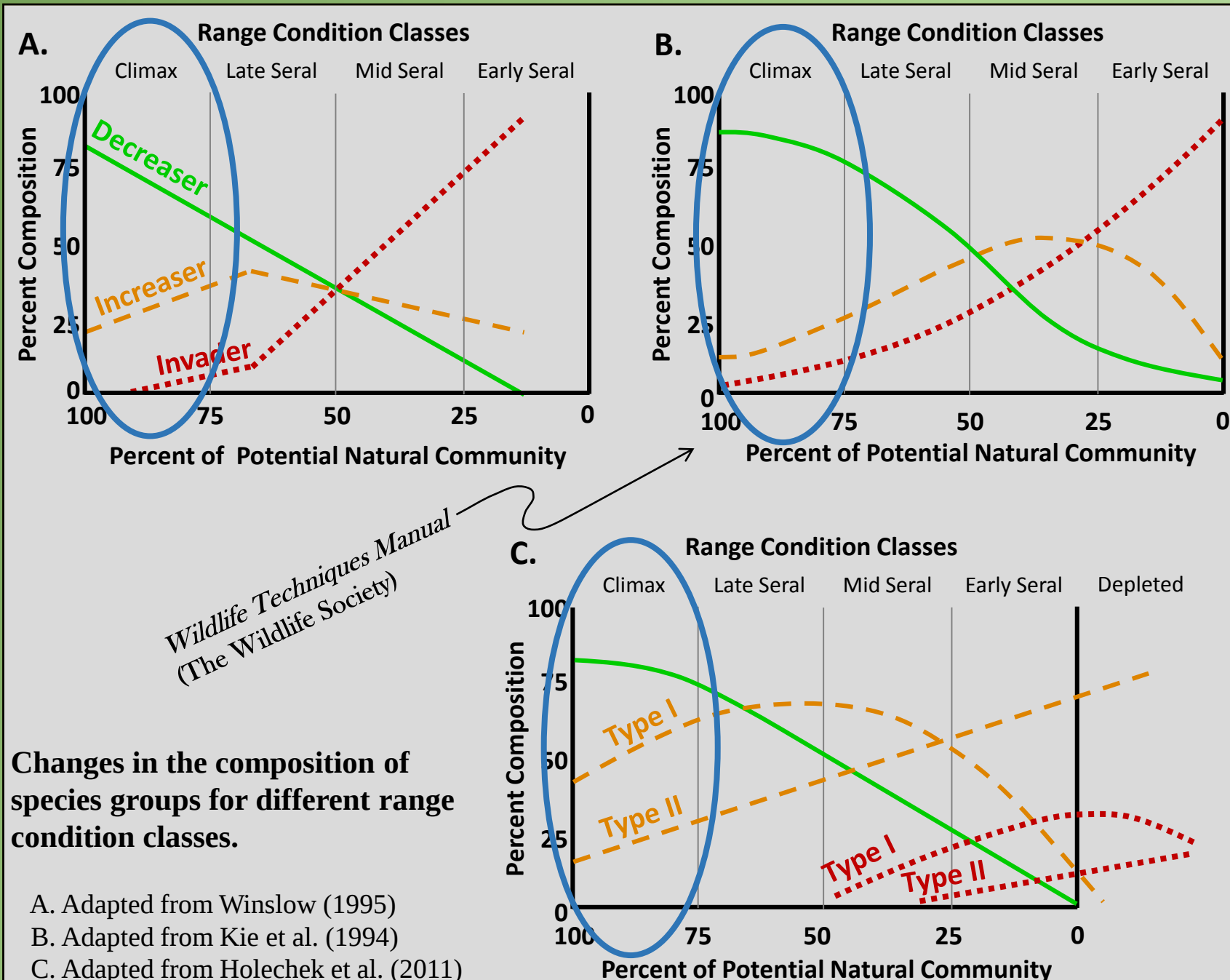
Forest Service Handbook:

Range Inventory Standardization Committee (1983) suggests $\geq 75\%$ similarity to PNC to differentiate between meeting and not meeting management objectives.

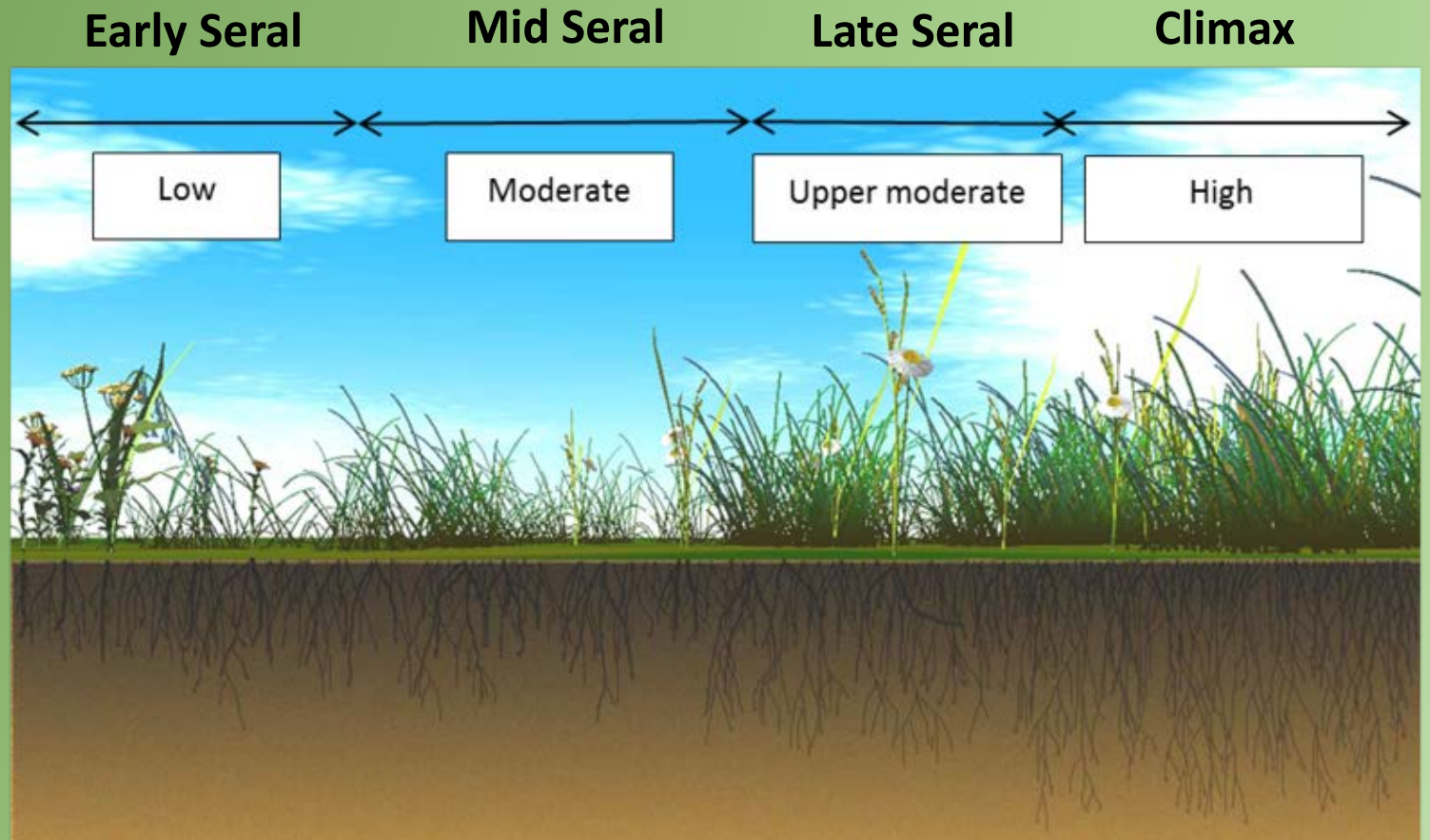
Best way to meet range of Forest Plan Objectives, Standards, and Prescriptions for wildlife:

- Extensive Science & Ecology
- 2012 Planning Rule

Wyoming Range Allotment Complex EIS and ROD adopted this (7 allotments, 3 districts).



Range Condition Classes



Range condition classes in a mountain meadow