Forest change and contemporary fire patterns with owl habitat requirements in historically frequent-fire forests

Change in frequent-fire forests:

Legacy of past management

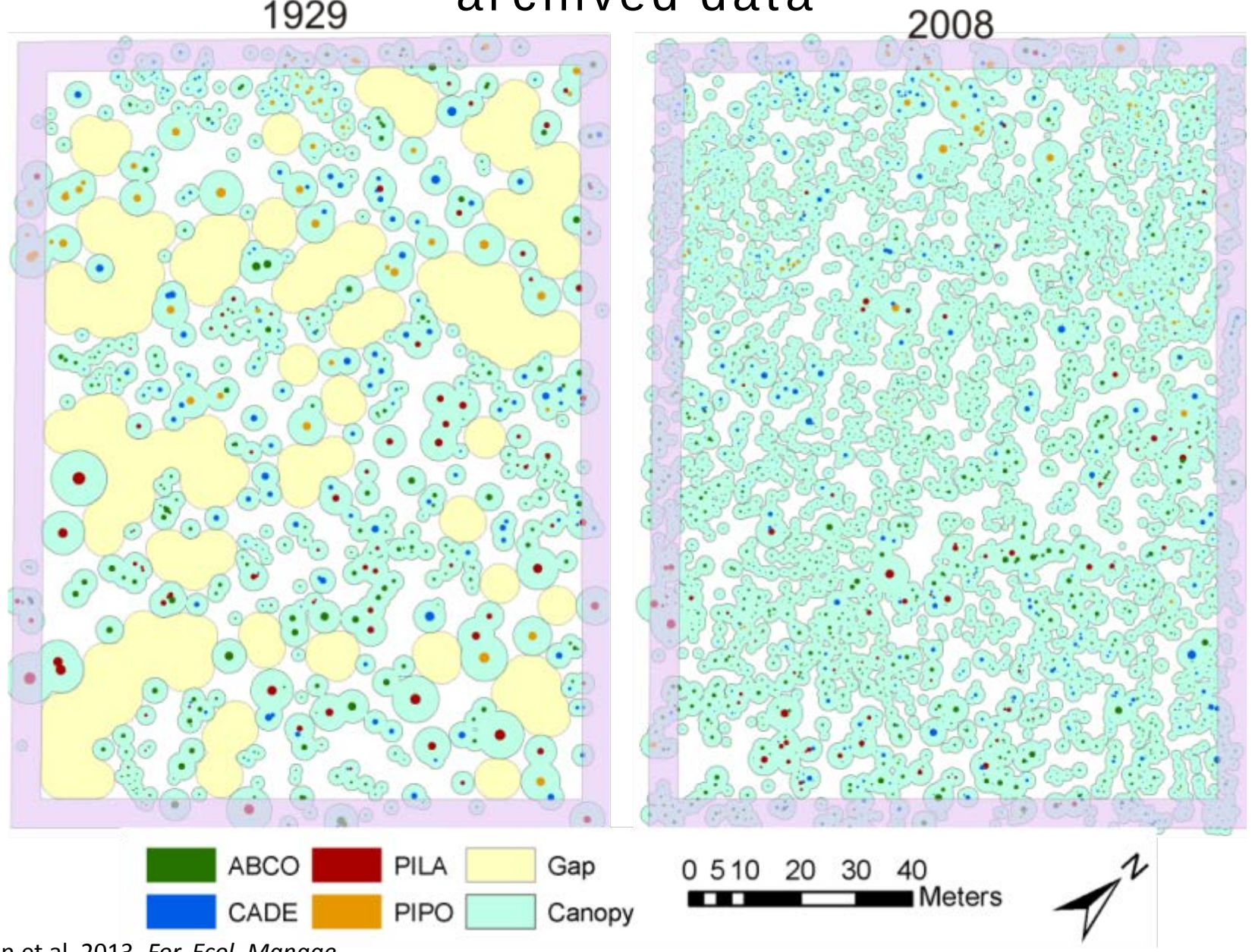
- Fire suppression, fire exclusion (100+ years)
- Timber harvesting

Forest change: fire suppression & exclusion

Show and Kotok (1924):

“That maximum protection or fire exclusion inevitably <u>increases hazard</u> by the encouragement of undergrowth is, of course, true, but such added hazard in no way vitiates the reasons for protection”

Historical forest structure and composition:
archived data



Lydersen et al. 2013, *For. Ecol. Manage.*

Form 321 a. ✓

UNITED STATES DEPARTMENT OF AGRICULTURE,
FOREST SERVICE.

"Forty" Estimate Sheet.

Slope SW

Tp. 1 S, R. 20 E, MD M. Sec. 19, Forty 3 NE¼ NW Course Due N

Sheet Number 243 Series, Date 7-8, 1911

Examiners { Estimator E H Coulson
Compassman J R Berry

D. B. H.	YP Species				SP Species				WF Species				IC Species				Miscellaneous Green; Dead (All Species)			
Ins.	1	2 Number	3 of logs	4	1	2 Number	3 of logs	4	1	2 Number	3 of logs	4	1	2 Number	3 of logs	4	YP	SP Number	WF of logs	IC
Poles	⊠																Seedlings			
12	··			✓									··		✓		15			20
14	··																Saplings			
16		·	✓														10			8
18		·											··				Dead			
	4	5 Number	6 of logs	7	4	5 Number	6 of logs	7	4	5 Number	6 of logs	7	3	4 Number	5 of logs	6	4	Number	of logs	3
20	·· ✓ ··	✓																		
22		· ✓																		
24	·· ✓	·· ✓											✓							
26		· ✓	·· ✓																	·
28			·· ✓	·· ✓													·			
30			·· ✓	·· ✓													6 log			
32			·· ✓										✓							
34			·· ✓	✓									··				·			
36			··	·· ✓									·· ✓	✓						
38				··									·	·						
	6	7 Number	8 of logs	9	6	7 Number	8 of logs	9	6	7 Number	8 of logs	9	3	6 Number	7 of logs	8	8	Number	of logs	
40			·· ✓																	
42				·· ✓															-	
44							·· ✓						·							
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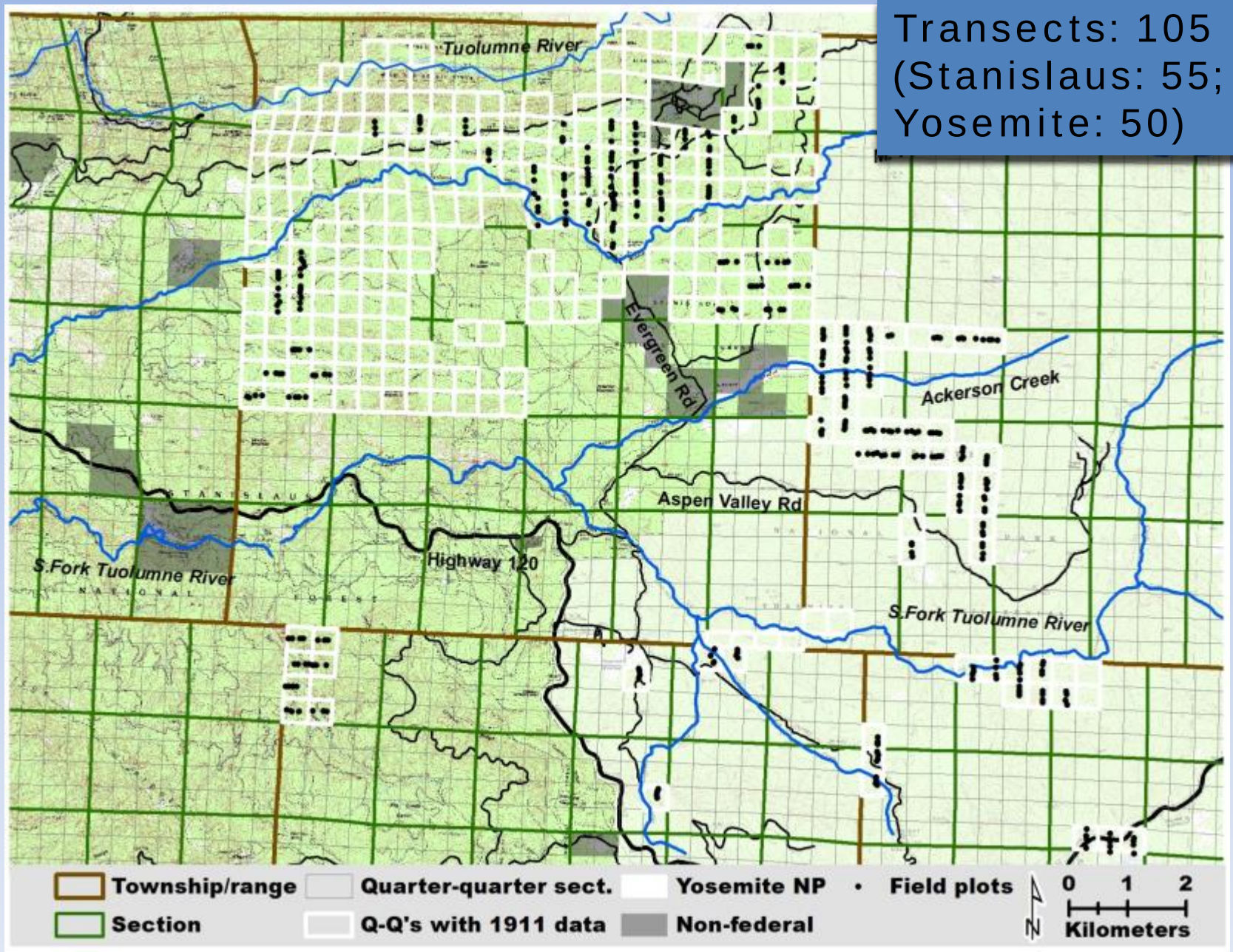
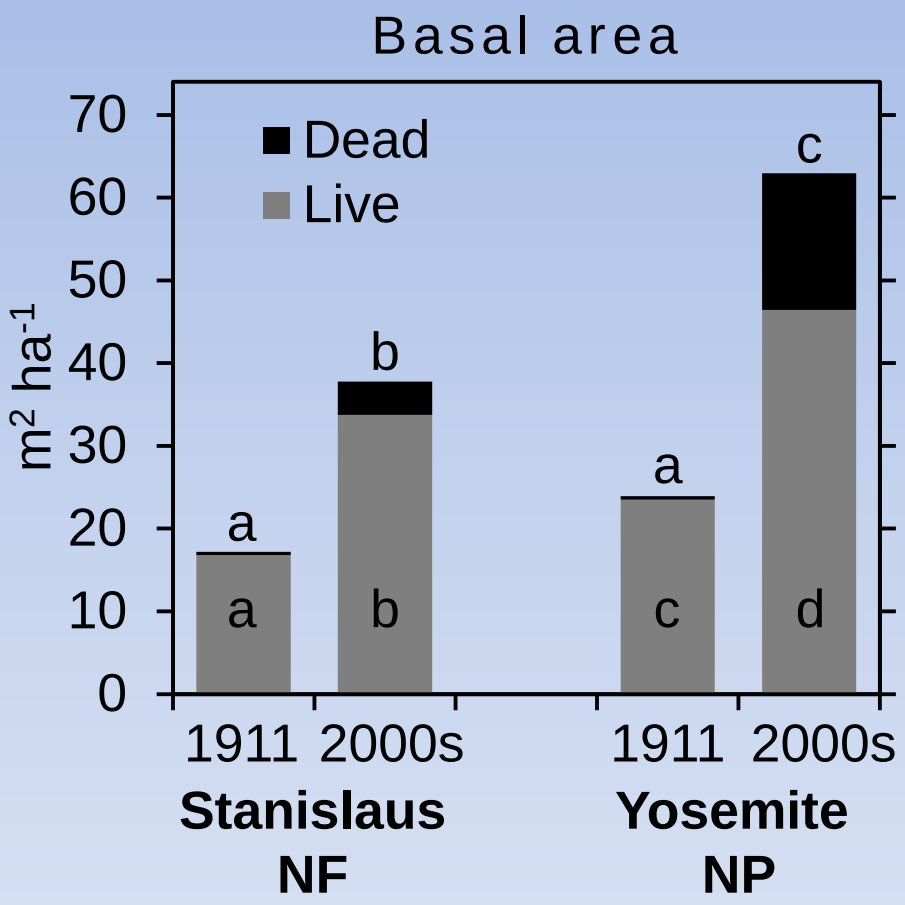
48																	-			
50	·			·· ✓																
52				··																

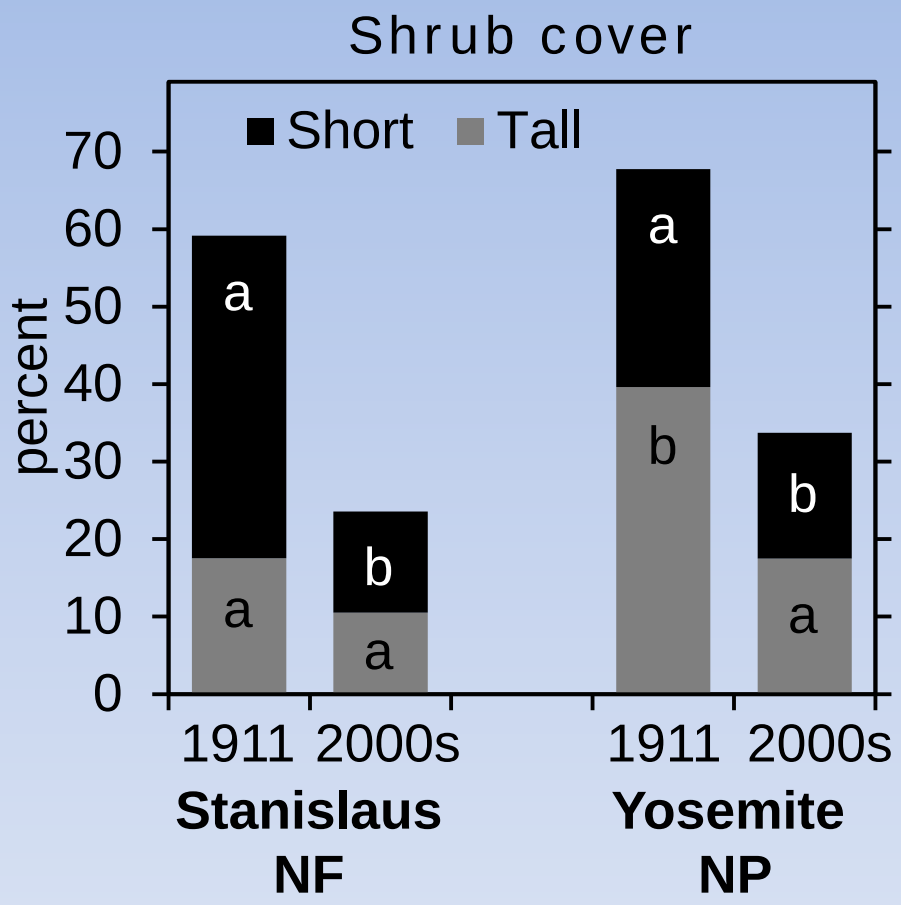
8—1198

Remeasure of 1911 timber survey transects



Forest structure and composition:
Historical vs. contemporary – NF vs. NP





Collins et al. 2017 *Ecol. Appl.*

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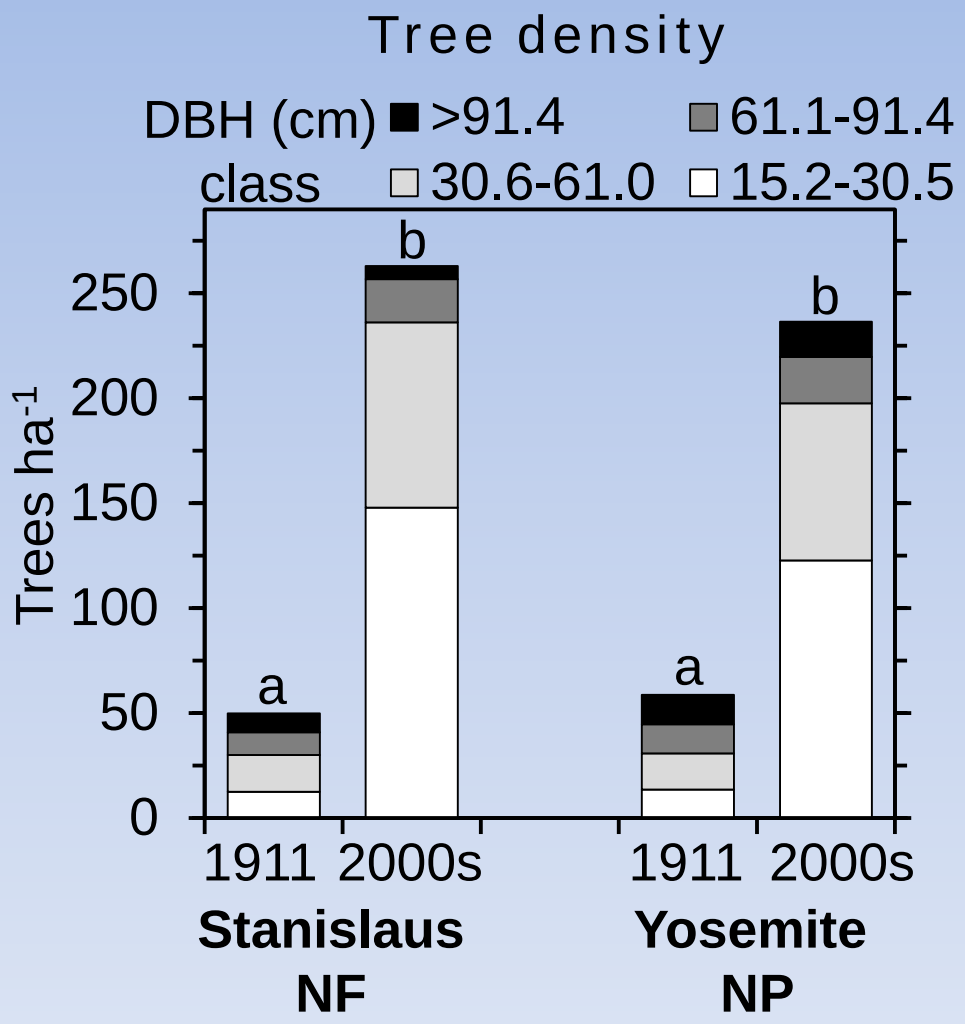
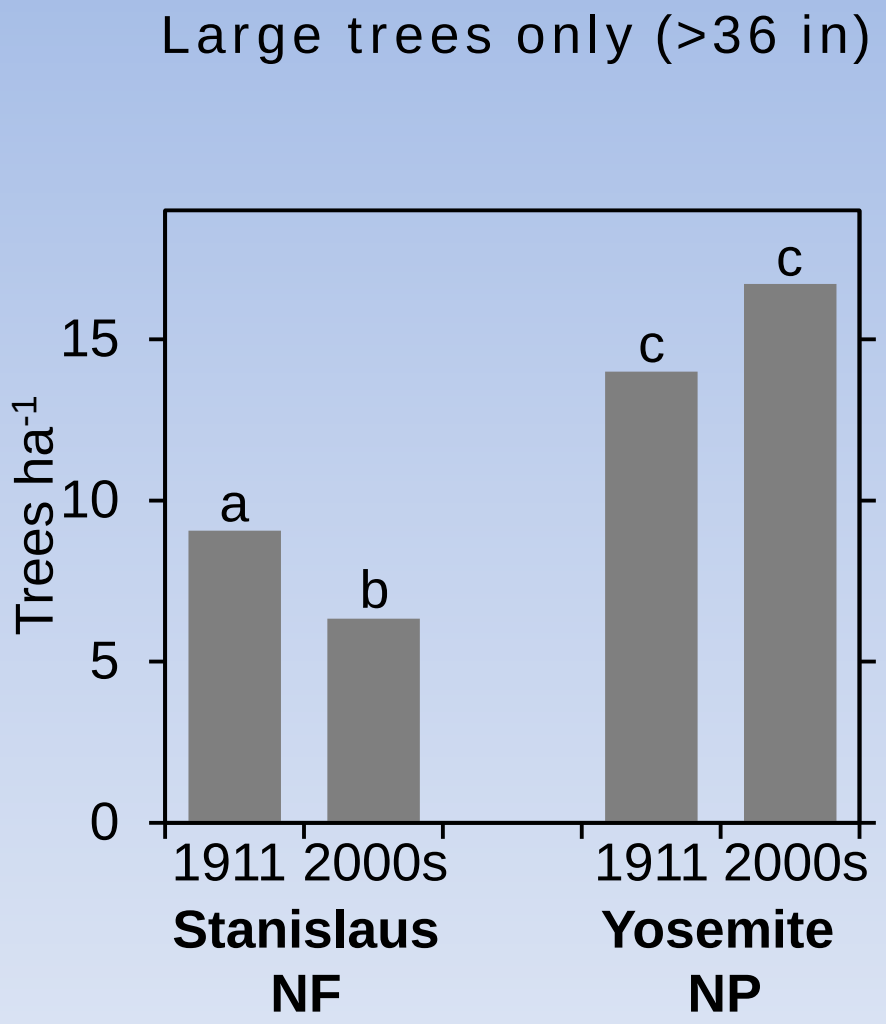
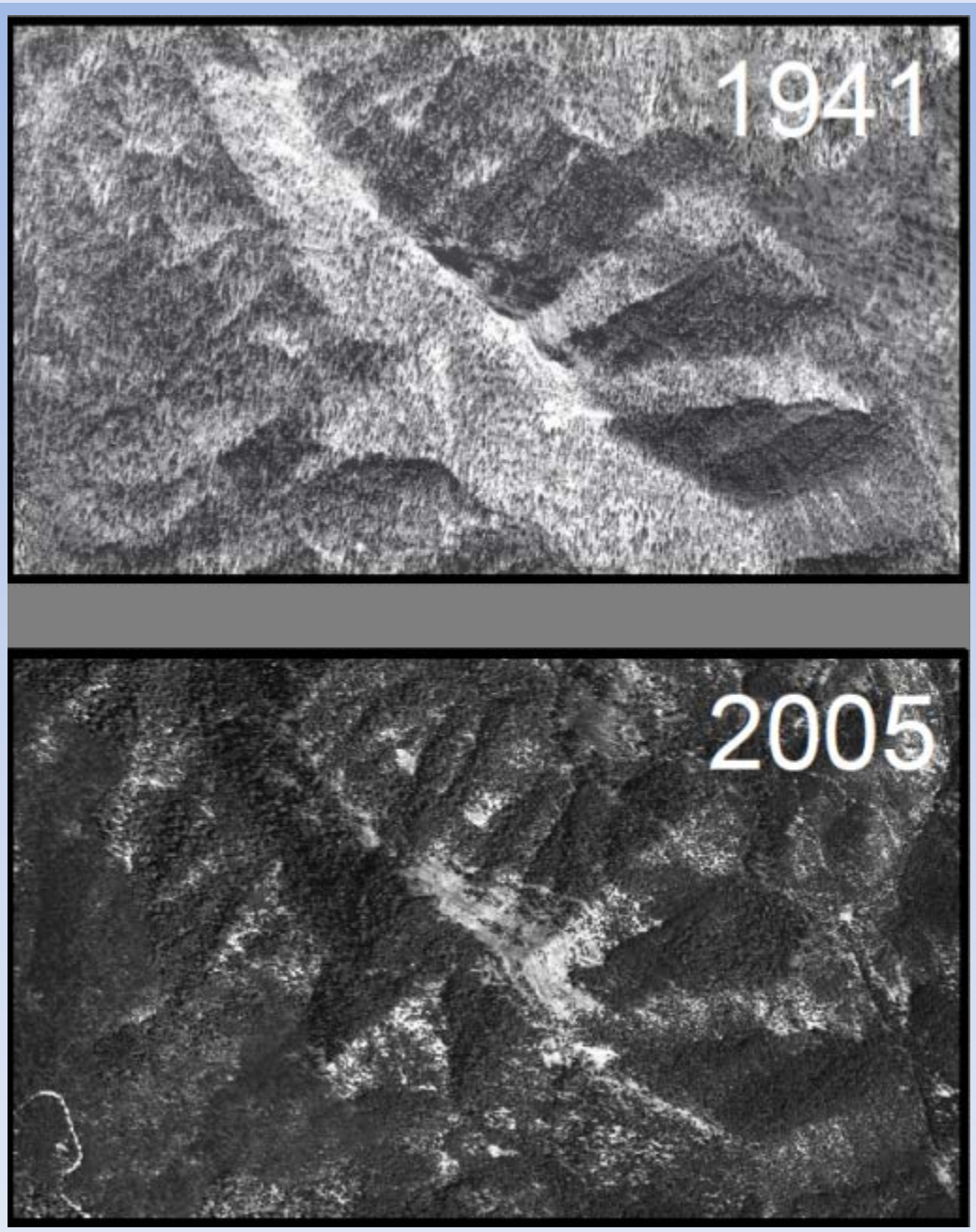
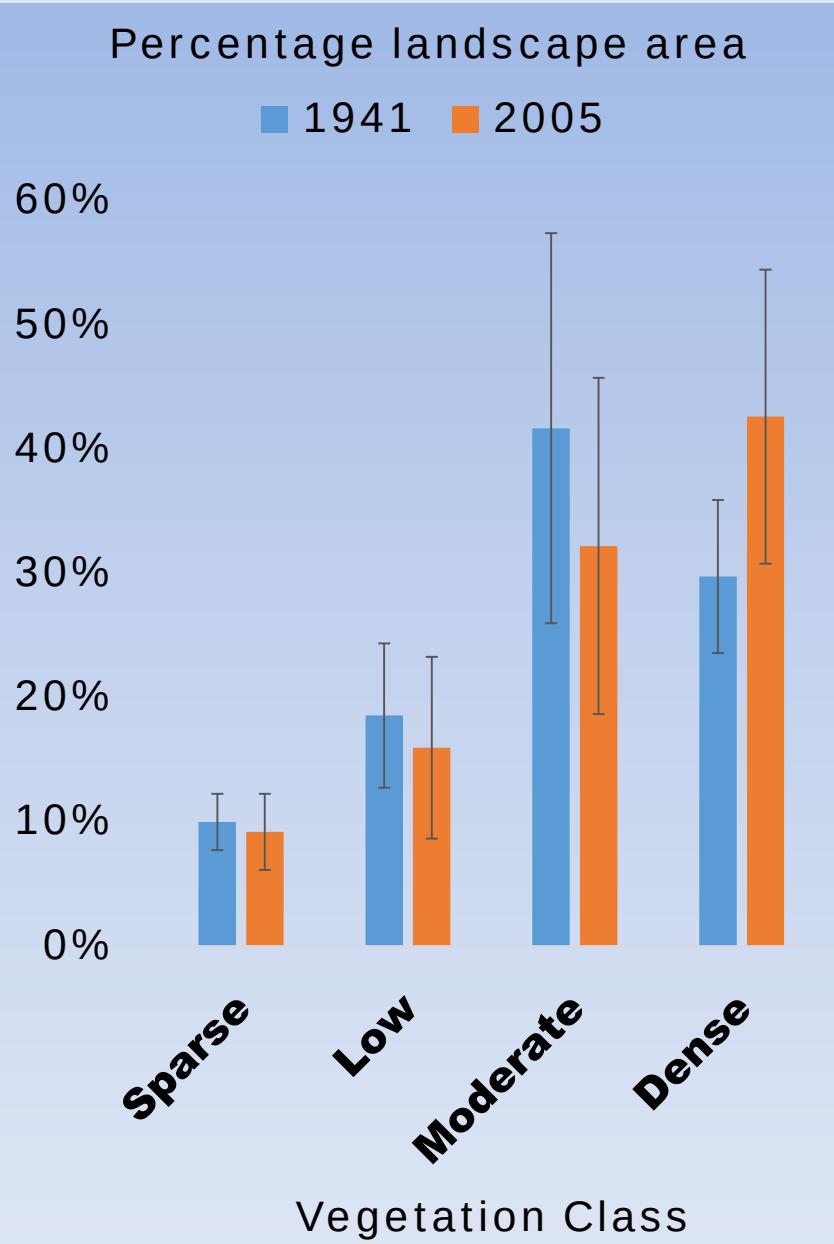




Collins et al. 2017 *Ecol. Appl.*

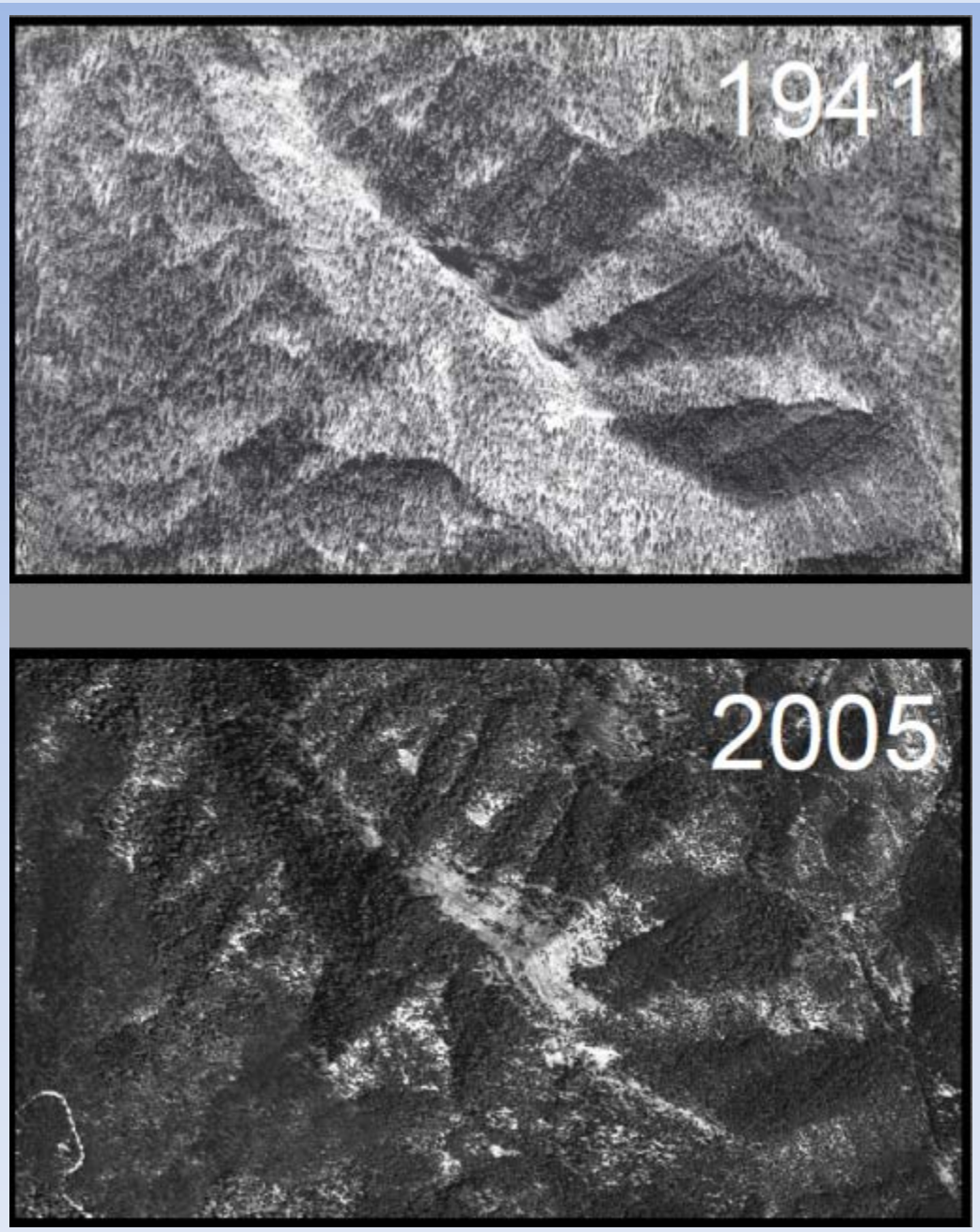
Landscape level vegetation change: Plumas NF

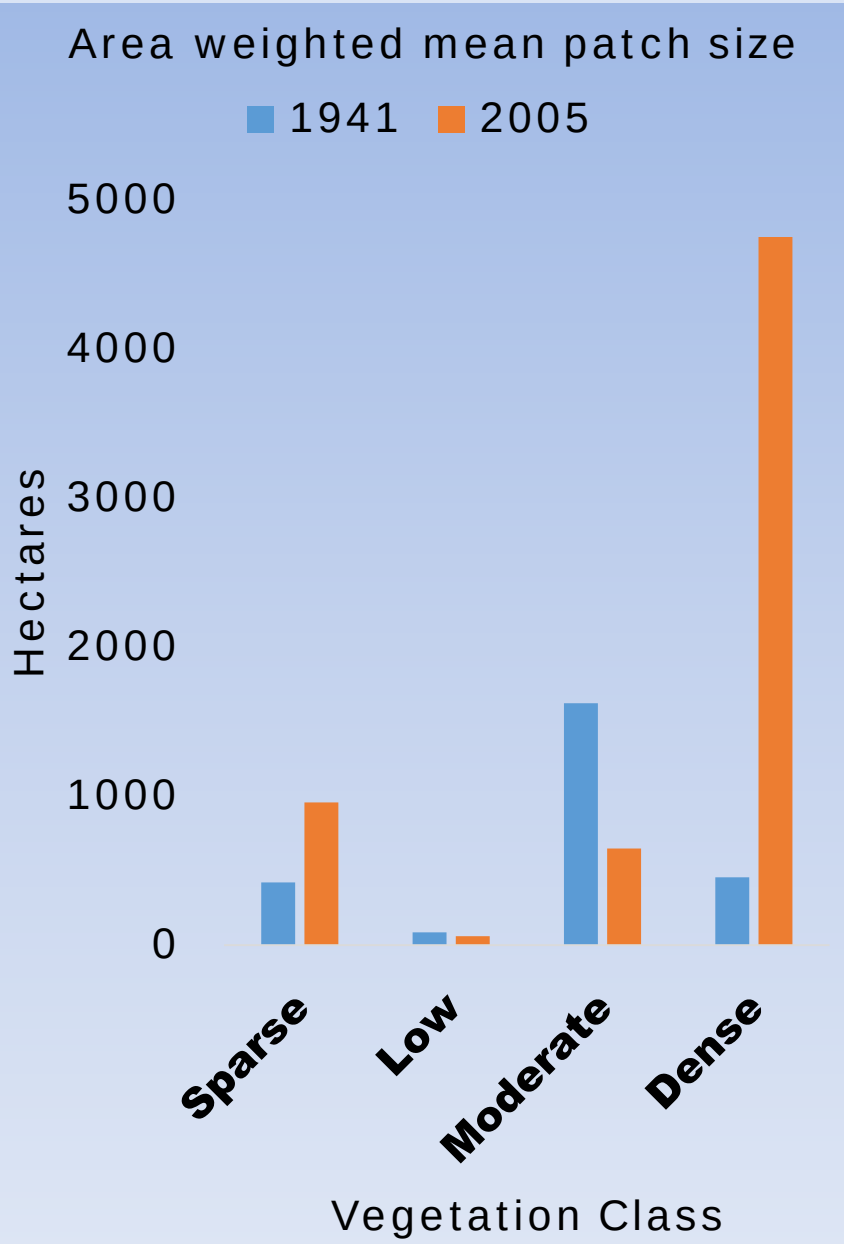




Lydersen and Collins in revision, *Ecosystems*

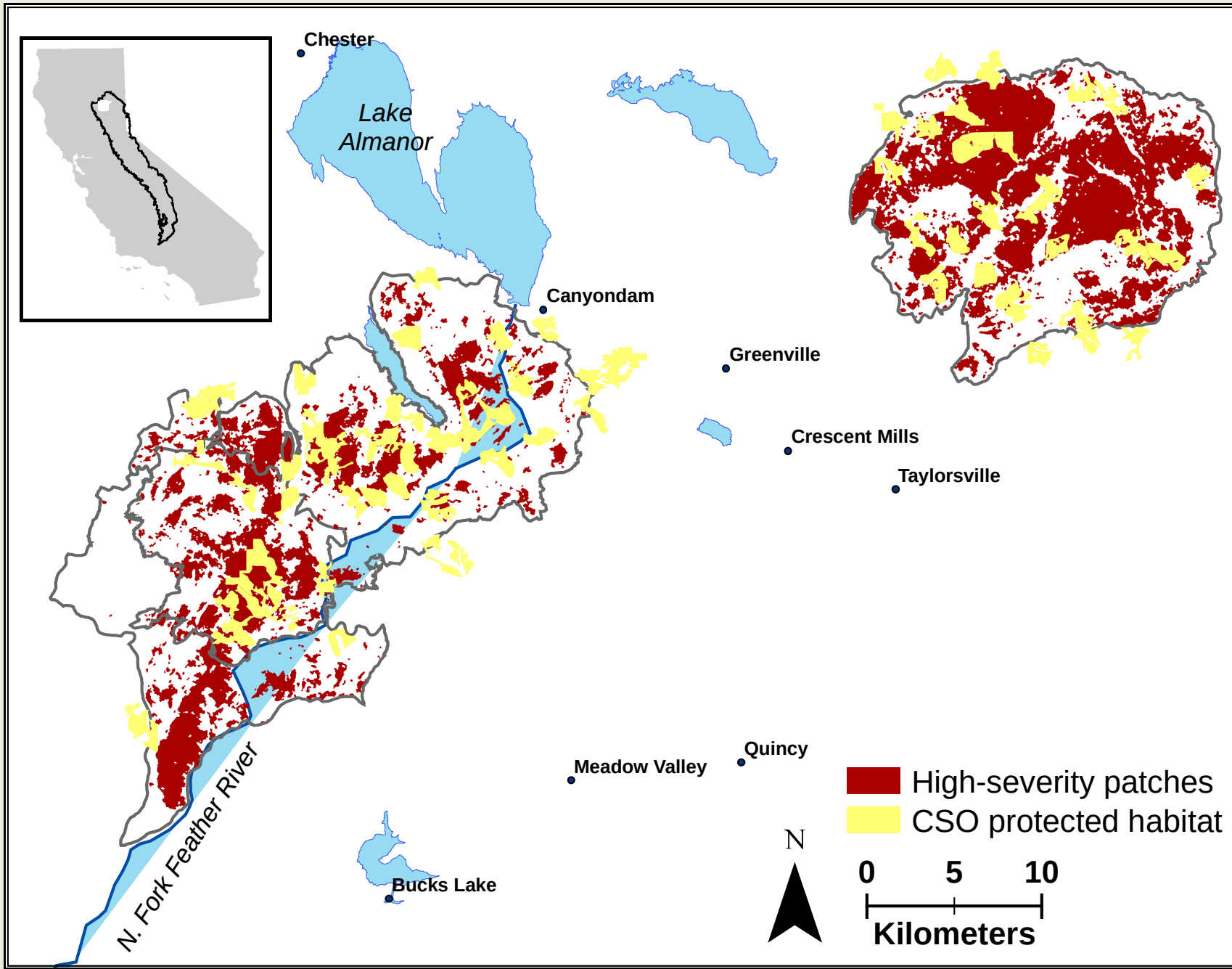
Landscape level vegetation change: Plumas NF



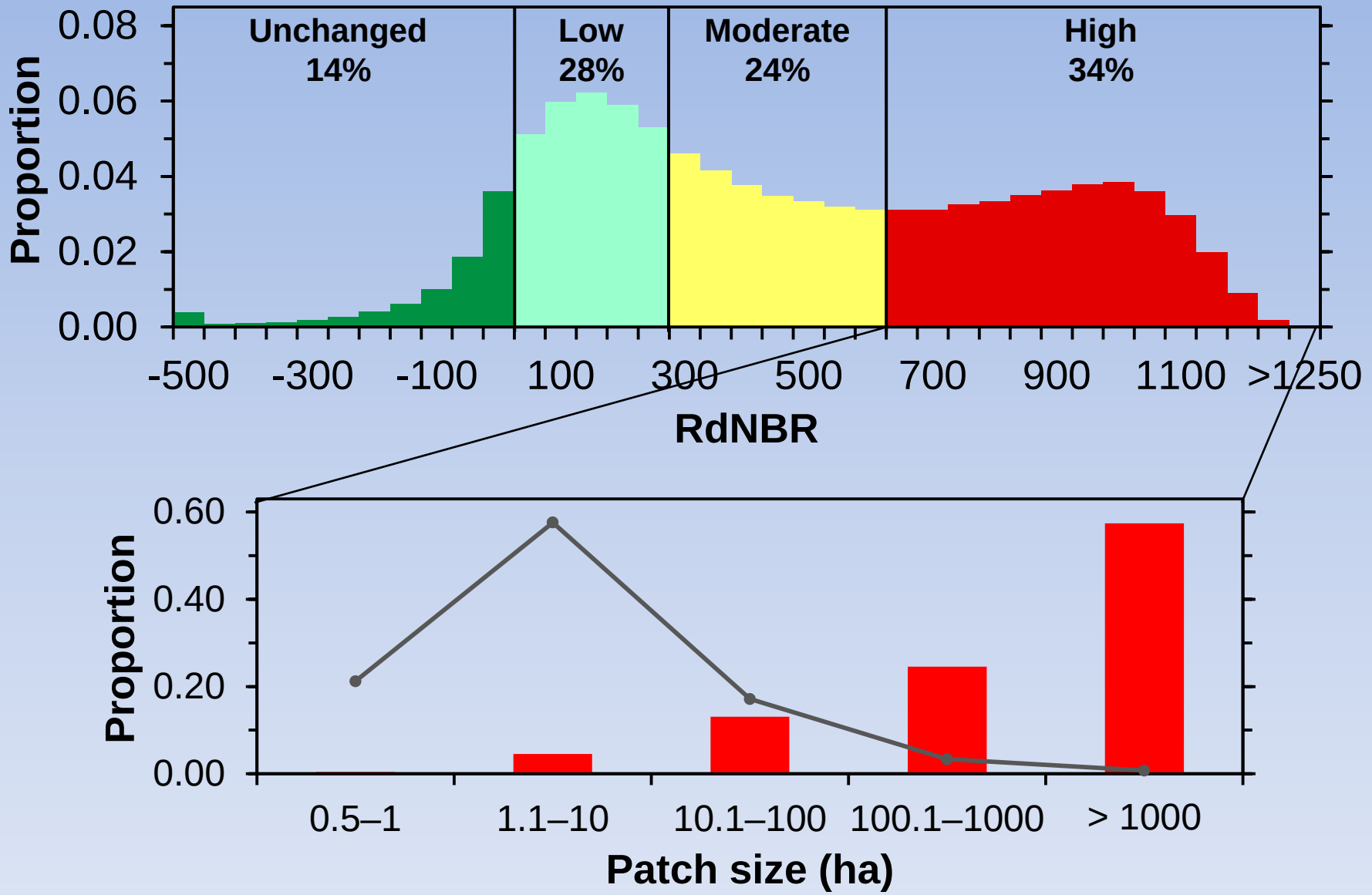


Lydersen and Collins in revision, *Ecosystems*

Contemporary N. Sierra fire patterns



Fire severity in recent large N. Sierra fires



Stephens et al. 2014 *Bioscience*

Burned area within CSO range:
USFS only, 2000 – 2014, mature, dense, mixed-conifer forests (CHWR 4,5,6,M,D)

National Forest	Total area in 2000 (ha)	BA ≥90% (ha)	BA ≥50% (ha)	BA ≥90% (%)	BA ≥50% (%)
Lassen	181,080	5,286	8,355	2.9	4.6
Plumas	270,866	20,531	28,147	7.6	10.4
Tahoe	164,554	4,338	6,931	2.6	4.2
Lk. Tahoe Bas.	14,670	378	464	2.6	3.2
Eldorado	111,260	9,688	11,777	8.7	10.6
Stanislaus	109,518	6,319	8,547	5.8	7.8
Sierra	179,588	2,455	4,653	1.4	2.6
Sequoia	134,915	10,783	16,173	8.0	12.0
Inyo	108	0	0	0.0	0.0

Stephens et al. 2016 *Ecosphere*

Key wildlife-fire issues land management agencies and the public will need to address:

- Vulnerability associated with forest change vs. dense, multi-layered habitat
- Impacts of restoration treatments vs. habitat loss to wildfire
- Identify what constitutes sustainable, viable wildlife populations