A bird's-eye view of forest fires in the West

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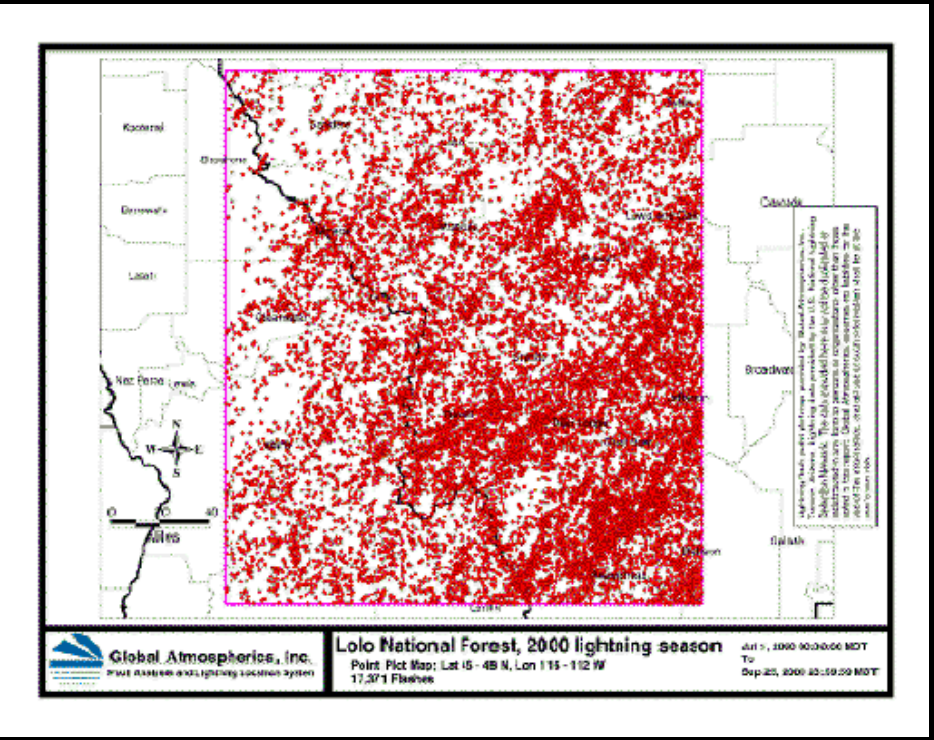
The Avian Science Center at the University of Montana

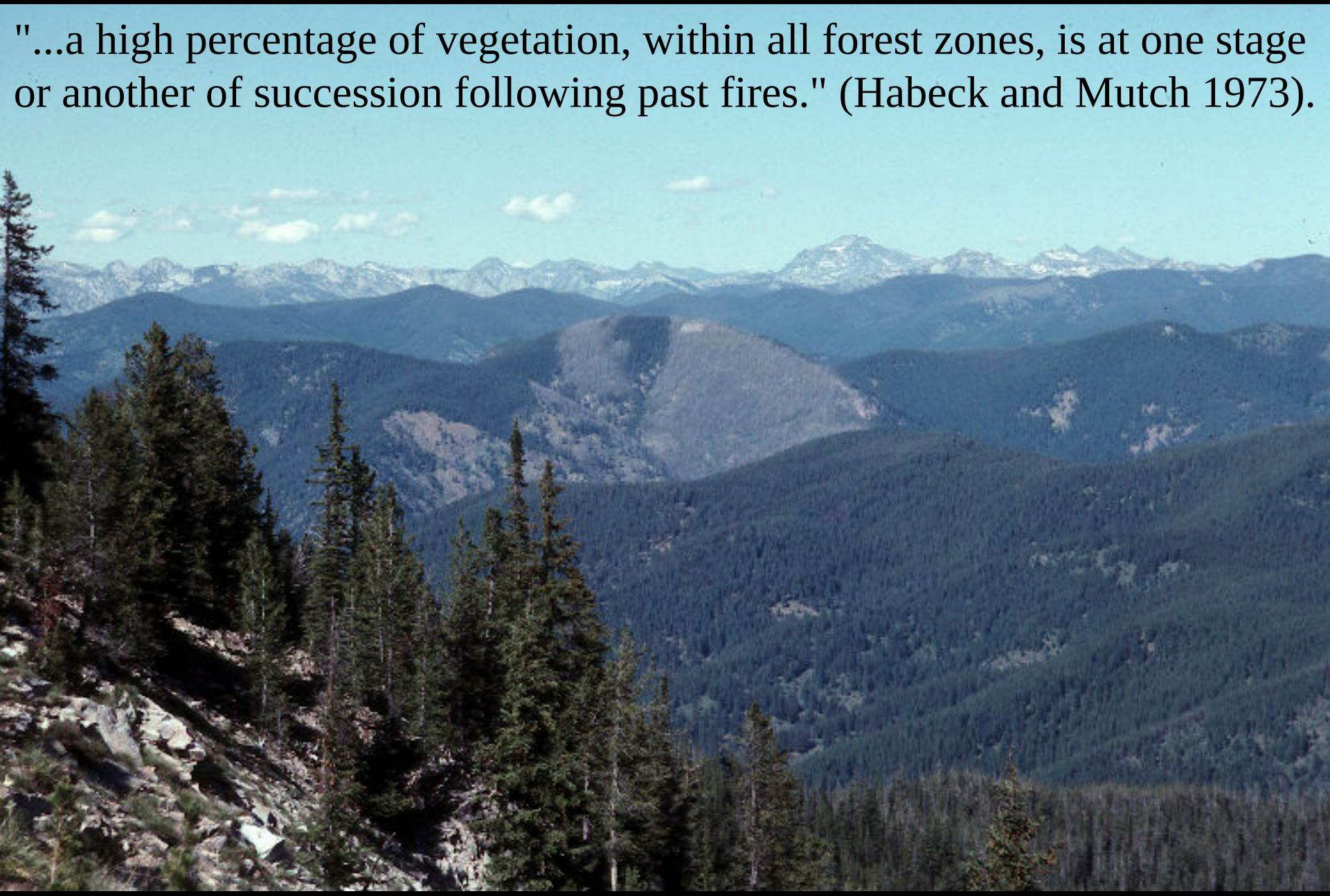
Our mission is “to promote ecological awareness and informed decision making through the collection, synthesis, and dissemination of science-based information on western birds.”

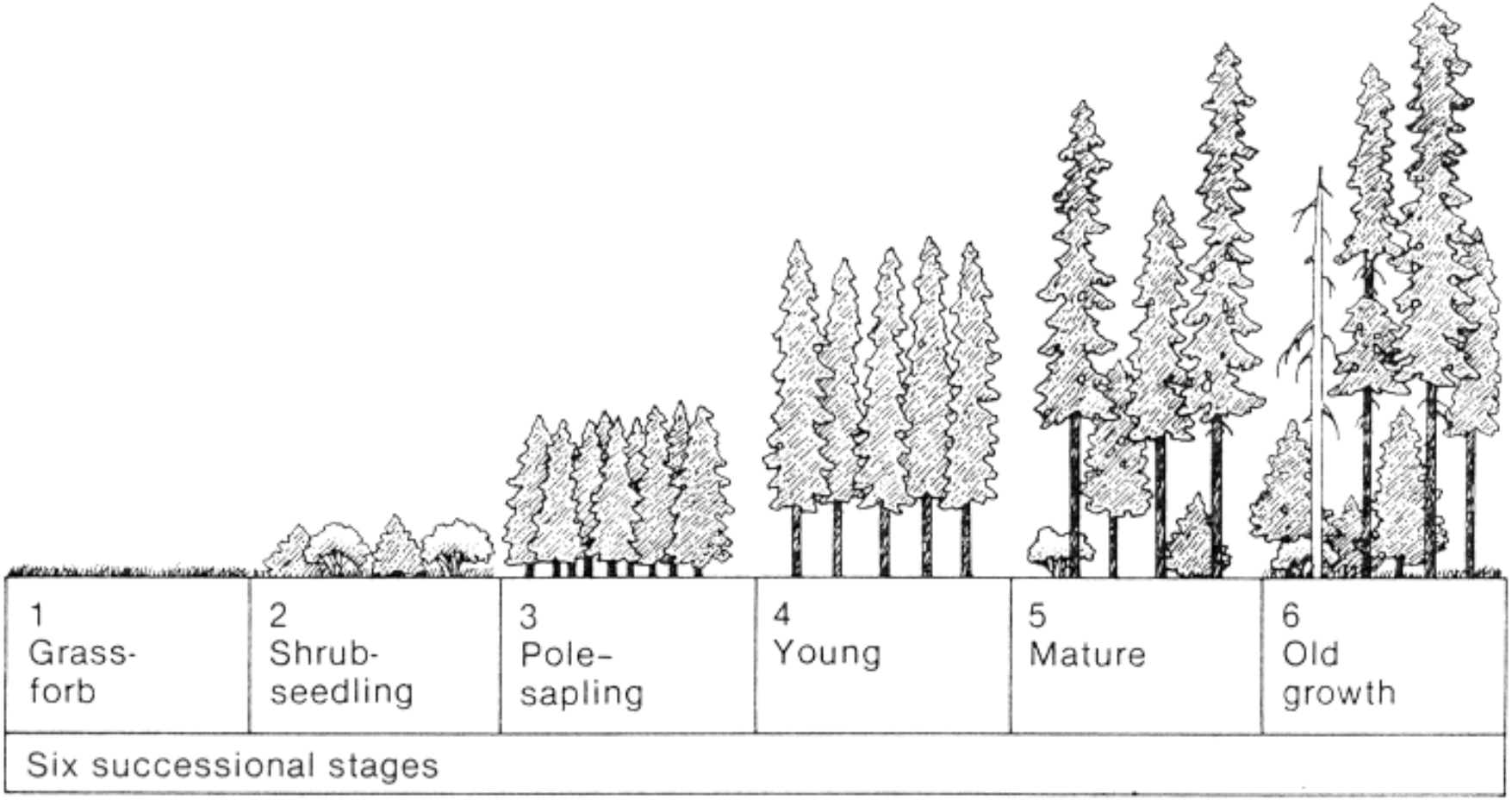
we're listening to the birds…



"Of all biotic and abiotic influences on vegetation, fires were the most prevalent major disturbances on the landscape prior to European settlement" (Gruell 1983).

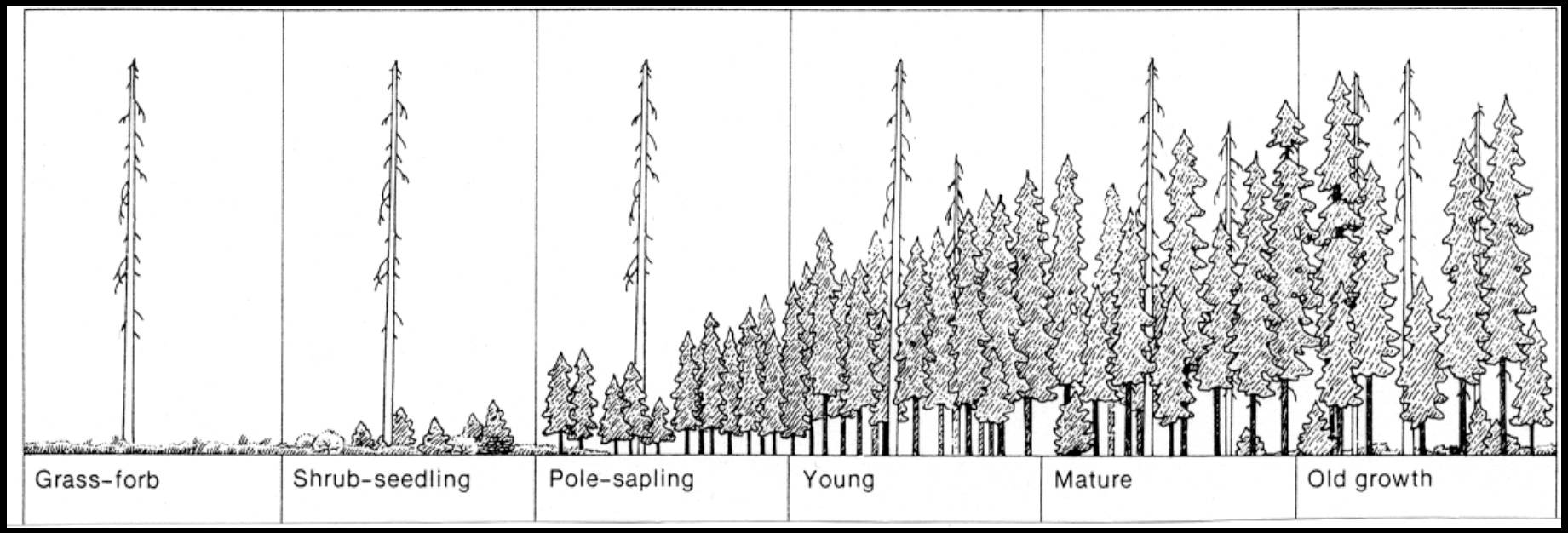
"...a high percentage of vegetation, within all forest zones, is at one stage or another of succession following past fires." (Habeck and Mutch 1973).





From Thomas (1979)

The kinds of fires that create **significant** ecological change are the major, severe, intense, devastating, horrible, catastrophic crown fires



From Thomas (1979)

1971
1848
1827

81
Nikon

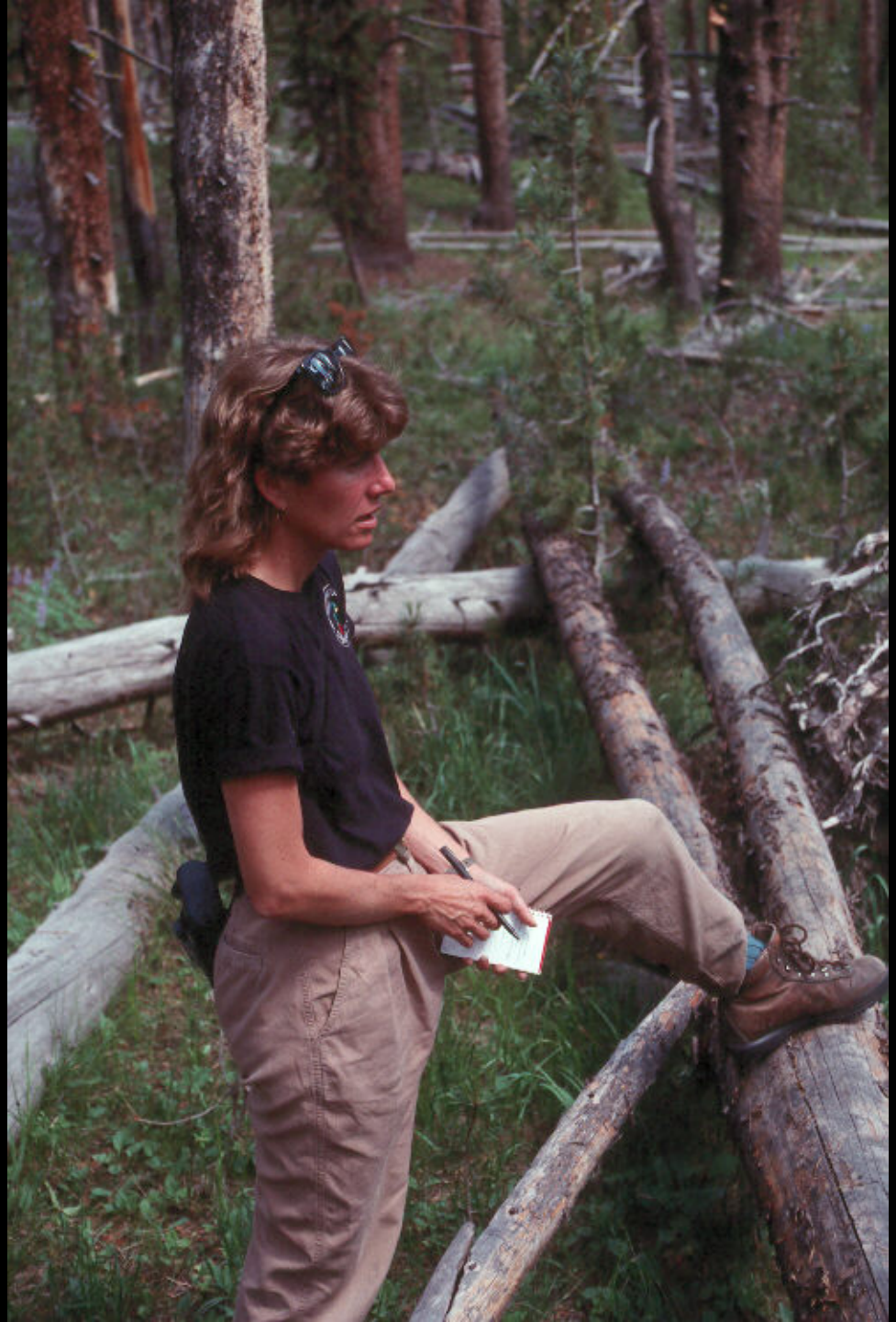


Table 2. Statistics for 87 bird species detected among 33 burned forest sites in the northern Rocky Mountains: number of sites occupied, mean number of individuals detected per 100-m-radius point (n = 597), percentage of 100-m-radius points on which the species was detected, migratory status, feeding zone, diet, and known nest site.

Species	*No. of Sites*	*No. of Individuals*	*Detection (%)*	*Status*[a]	*Feeding Zone*[b]	*Diet*[c]	*Nest Site*[d]
Osprey, *Pandion haliaetus*	4	0.010	0.84	M	W	F	S/O
Sharp-shinned Hawk, *Accipiter striatus*	4	0.007	0.67	M	G/A	V	—
Cooper's Hawk, *Accipiter cooperii*	2	0.003	0.34	M	G/A	V	—
Red-tailed Hawk, *Buteo jamaicensis*	8	0.035	2.68	M	G	V	S/C
American Kestrel, *Falco sparverius*	5	0.015	1.34	M	G	V	S/O
Blue Grouse, *Dendragapus obscurus*	4	0.010	1.01	R	G	O	—
Ruffed Grouse, *Bonasa umbellus*	4	0.012	1.17	R	G	O	—
rane, *Grus canadensis*	3	0.013	0.84	M	G	V	—
andpiper, *Actitis macularia*	4	0.017	1.51	M	G		
Snipe, *Gallinago gallinago*	4	0.052	3.85	M	G		
Dove, *Zenaida macroura*	4	0.032	1.68	M	G		
Nighthawk, *Chordeiles minor*	2	0.005	0.34	M	A		
vift, *Chaetura vauxi*	3	0.025	0.84	M	A		
Hummingbird, *Stellula calliope*	6	0.012	1.17	M	F	I	
ummingbird, *Selasphorus rufus*	4	0.049	2.51	M	F	I	
ngfisher, *Ceryle alcyon*	1	0.002	0.17	M	W	I	
d Sapsucker, *Sphyrapicus nuchalis*	4	0.062	4.52	M	B		
n's Sapsucker, *Sphyrapicus thyroideus*	5	0.013	1.34	M	B		
Woodpecker, *Picoides pubescens*	2	0.003	0.34	R	B		
odpecker, *Picoides villosus*	30	0.213	17.42	R	B		
Three-toed Woodpecker, *Picoides tridactylus*	14	0.099	8.04	R	B		
Black-backed Woodpecker, *Picoides arcticus*	11	0.062	5.53	R	B		
Northern Flicker, *Colaptes auratus*	28	0.305	26.47	M	G		
Pileated Woodpecker, *Dryocopus pileatus*	4	0.018	1.51	R	B		
Olive-sided Flycatcher, *Contopus borealis*	18	0.168	15.58	M	A		
Western Wood-Pewee, *Contopus sordidulus*	11	0.104	8.88	M	A		
Willow Flycatcher, *Empidonax trailii*	2	0.008	0.67	M	A	I	—
Hammond's Flycatcher, *Empidonax hammondii*	9	0.045	3.52	M	A	I	—
Dusky Flycatcher, *Empidonax oberholseri*	16	0.147	12.73	M	A	I	F/O
Tree Swallow, *Tachycineta bicolor*	6	0.310	11.39	M	A	I	S/C
Cliff Swallow, *Hirundo pyrrhonota*	1	0.020	0.50	M	A	I	—
Gray Jay, *Perisorius canadensis*	8	0.027	2.18	R	F/G	O	
Steller's Jay, *Cyanocitta stelleri*	6	0.032	2.18	R	F/G	O	
Clark's Nutcracker, *Nucifraga columbiana*	18	0.157	10.89	R	F/G	S	
Black-billed Magpie, *Pica pica*	1	0.002	0.17	R	G	O	
mon Raven, *Corvus corax*	18	0.121	10.05	R	F/G	O	
k-capped Chickadee, *Parus atricapillus*	13	0.039	3.18	R	F	I	
ntain Chickadee, *Parus gambeli*	21	0.164	13.23	R	F	I	
stnut-backed Chickadee, *Parus rufescens*	1	0.003	0.17	R	F	I	
breasted Nuthatch, *Sitta canadensis*	24	0.317	24.12	R	B	I	
wn Creeper, *Certhis americana*	2	0.003	0.34	R	B	I	
k Wren, *Salpinctes obsoletus*	2	0.005	0.50	M	G	I	
se Wren, *Troglodytes aedon*	8	0.067	5.53	M	G	I	
ter Wren, *Troglodytes troglodytes*				M	G	I	
rican Dipper, *Cinclus mexicanus*				M	W	I	
len-crowned Kinglet, *Regulus satrapa*				M	F	I	
y-crowned Kinglet, *Regulus calendula*				M	F	I	
tern Bluebird, *Sialia mexicana*				M	G	I	
ialia currucoides				M	G	I	
Myadestes townsendi				M	G	I	
atharus swainsoni							
arus guttatus							
dus migratorius							
us naevius							
nbycilla cedrorum							
urnus vulgaris							
solitarius	7	0.020	2.01				
gilvus	11	0.121	9.88				
bler, *Vermivora celata*	6	0.032	2.51				

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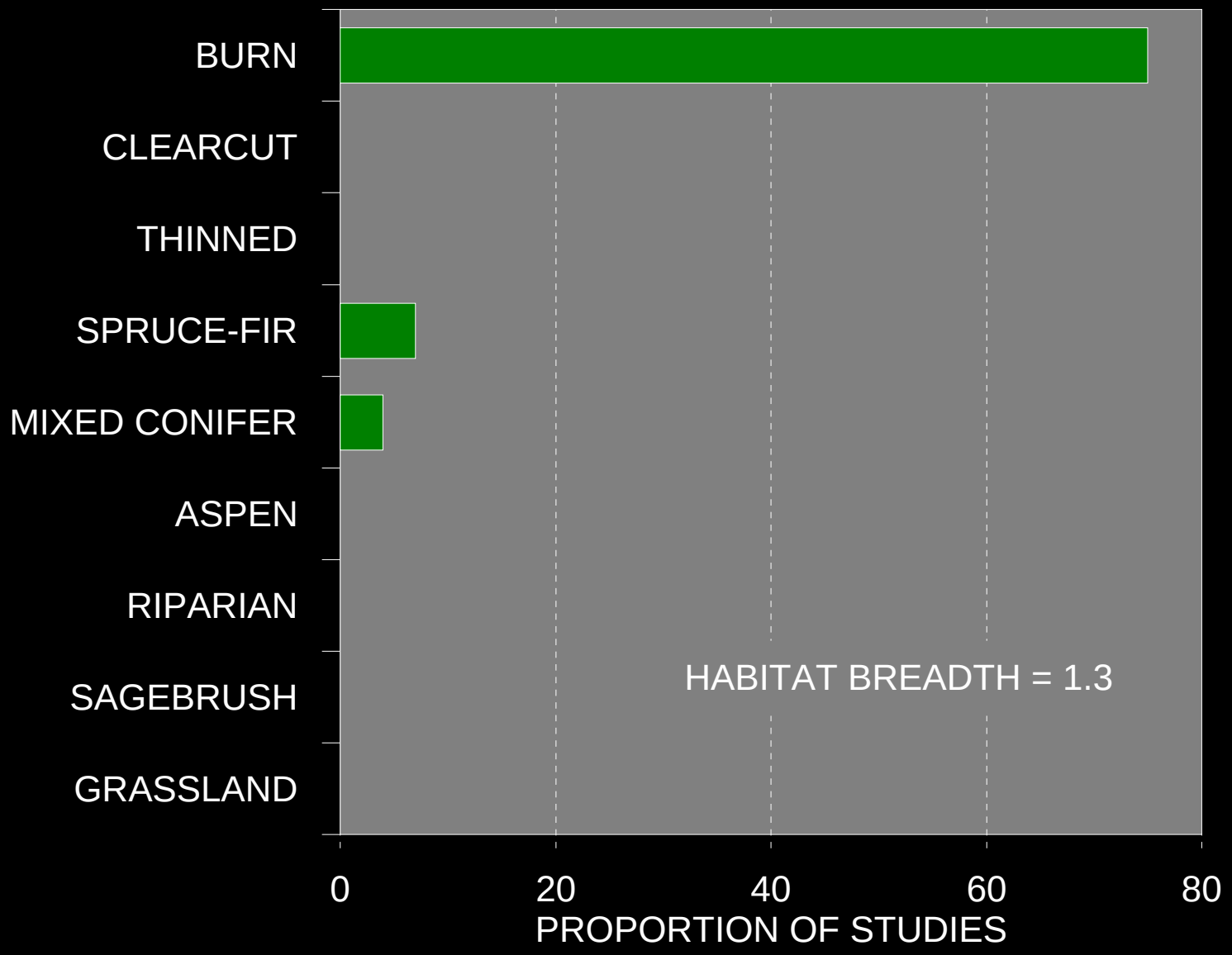
BLACK-BACKED WOODPECKER



What was found in the burn

Just what were 20,000 uncommon black-backed woodpeckers doing there? Naturalist Nick Escott is determined to find out

BY MARGARET CARNEY

WOODLAND CARIBOU, not woodpeckers, were the main quarry for a small but enthusiastic band of Thunder Bay Field Naturalists one Saturday in January 1999. That in itself was notable; what other Ontario naturalist club schedules an annual outing to see caribou?

But on the snowy road stretching 250 kilometres north of Thunder Bay to the whistle-stop town of Armstrong, Nick Escott and his passengers were in for a big surprise — one that has led to questions Escott and other naturalists are still trying to answer.

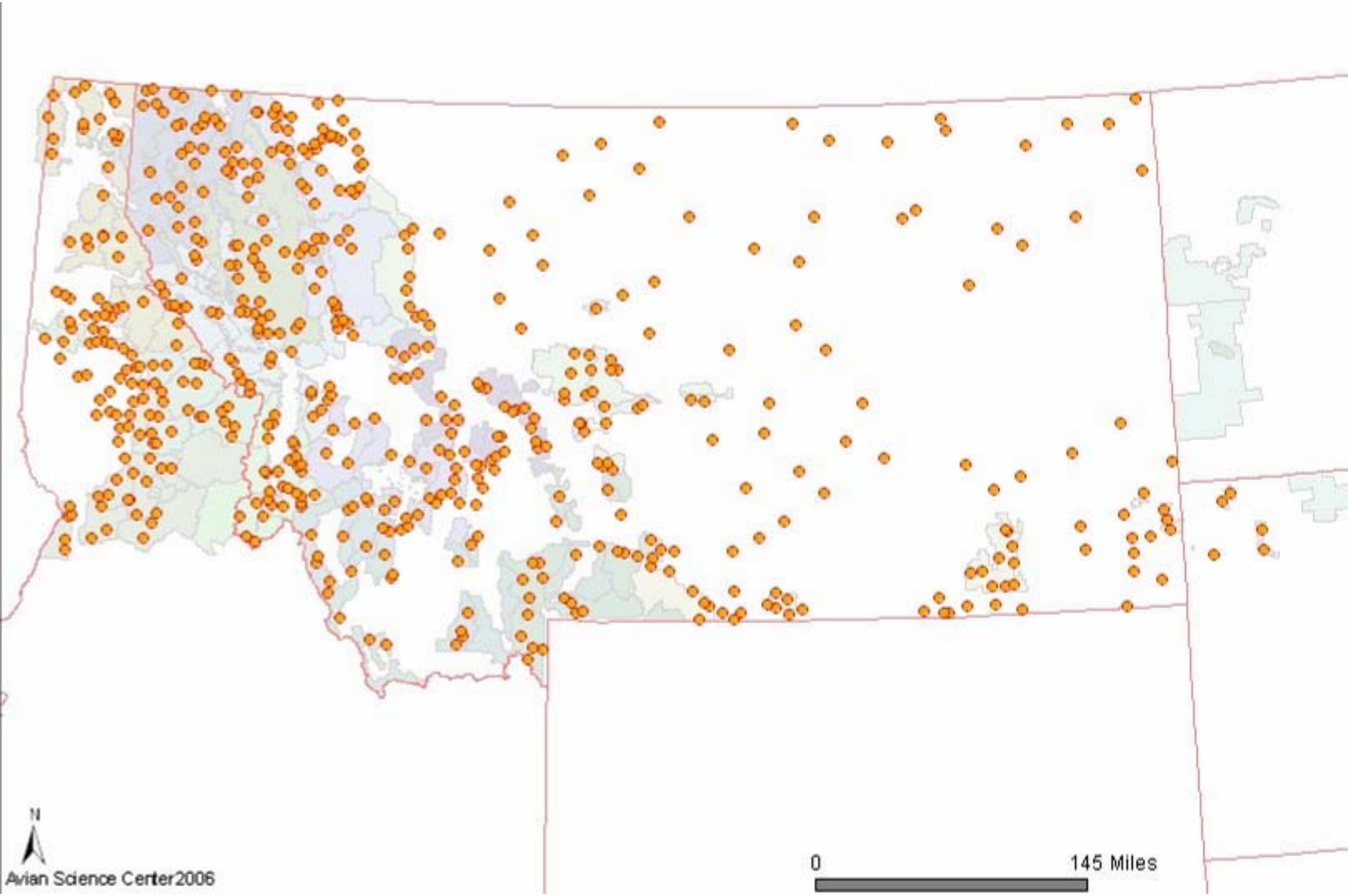
"I thought the other car was behind us, not in front," Escott recalls with a chuckle. "Otherwise I never would have stopped at the burn." His friend Al Harris, the second driver, was picking up another participant. Escott made a quick detour himself — for coffee and doughnuts, usual field trip fare for this high-energy birder. It didn't occur to him that Harris's group might get ahead, zipping up Highway 527 toward the appointed rendezvous spot in Armstrong.

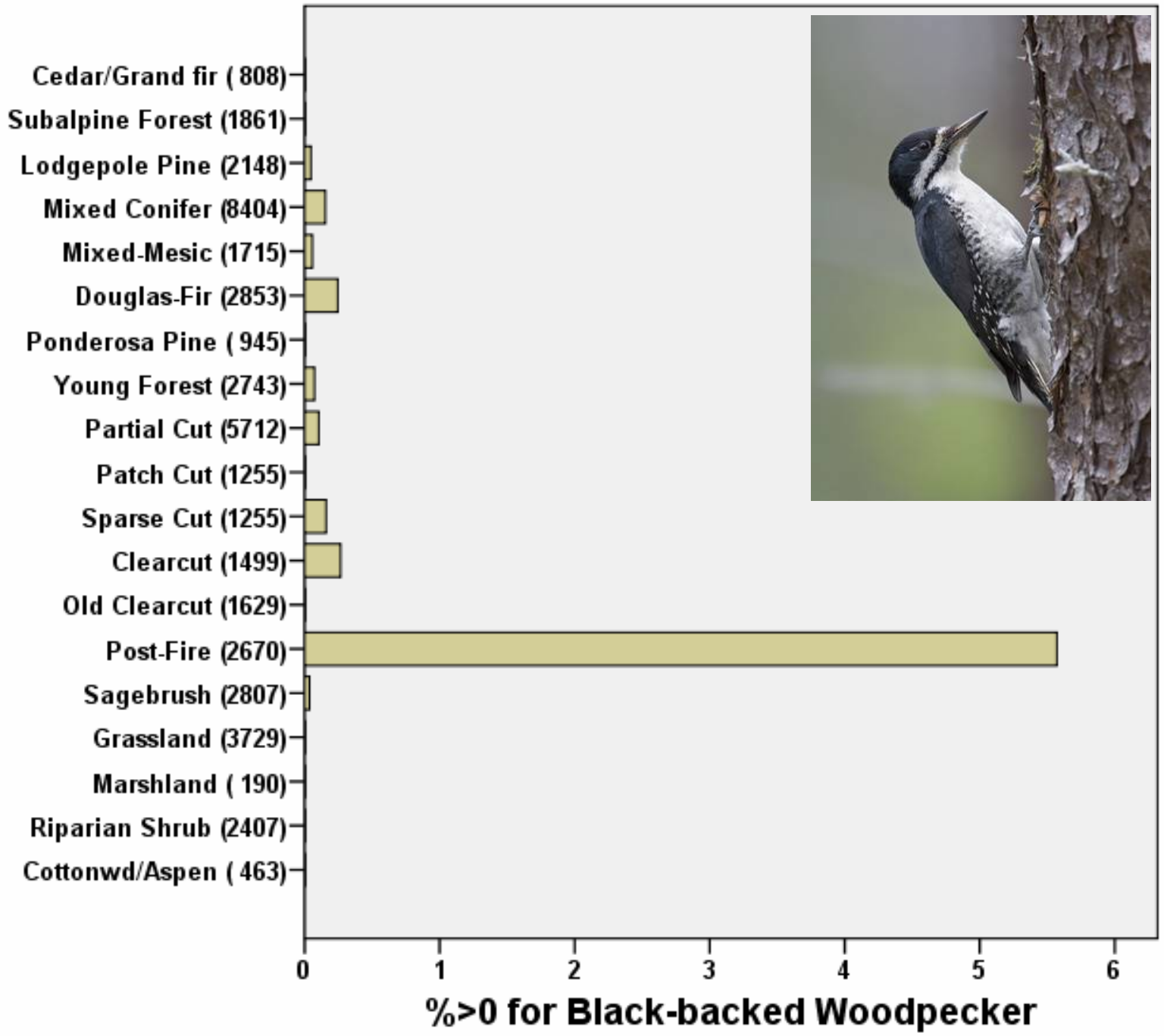
In 1998, a mammoth forest fire, measuring 26,400 hectares, had scorched a wide swath along the road. Starting in early spring, an exceptionally dry one, the fire raged for four months. Escott wanted to check the area for woodpeckers, known to frequent recent burns. Expecting Harris to catch up at any minute, he pulled over when he reached the first charred trees.

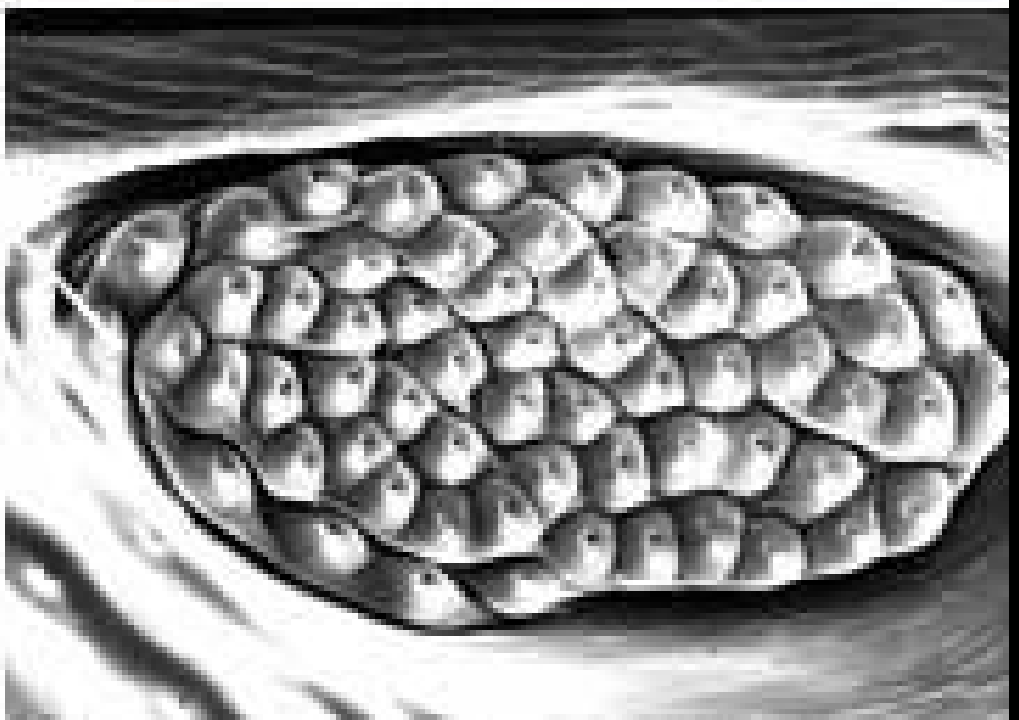
Piling out of his roomy green Suburban, binoculars in hand, the natural-

Opposite page: James Richards/This page: Margaret Carney

In reference to Black-backs, Manly Hardy wrote Maj. Bendire in 1895 that “specimens are so abundant in fire-killed timber areas that I once shot the heads off six in a few minutes when short of material for a stew!” (Bent 1939)


N
Avian Science Center 2006
0
145 Miles


Cedar/Grand fir (808)
Subalpine Forest (1861)
Lodgepole Pine (2148)
Mixed Conifer (8404)
Mixed-Mesic (1715)
Douglas-Fir (2853)
Ponderosa Pine (945)
Young Forest (2743)
Partial Cut (5712)
Patch Cut (1255)
Sparse Cut (1255)
Clearcut (1499)
Old Clearcut (1629)
Post-Fire (2670)
Sagebrush (2807)
Grassland (3729)
Marshland (190)
Riparian Shrub (2407)
Cottonwd/Aspen (463)
0
1
2
3
4
5
6
%>0 for Black-backed Woodpecker



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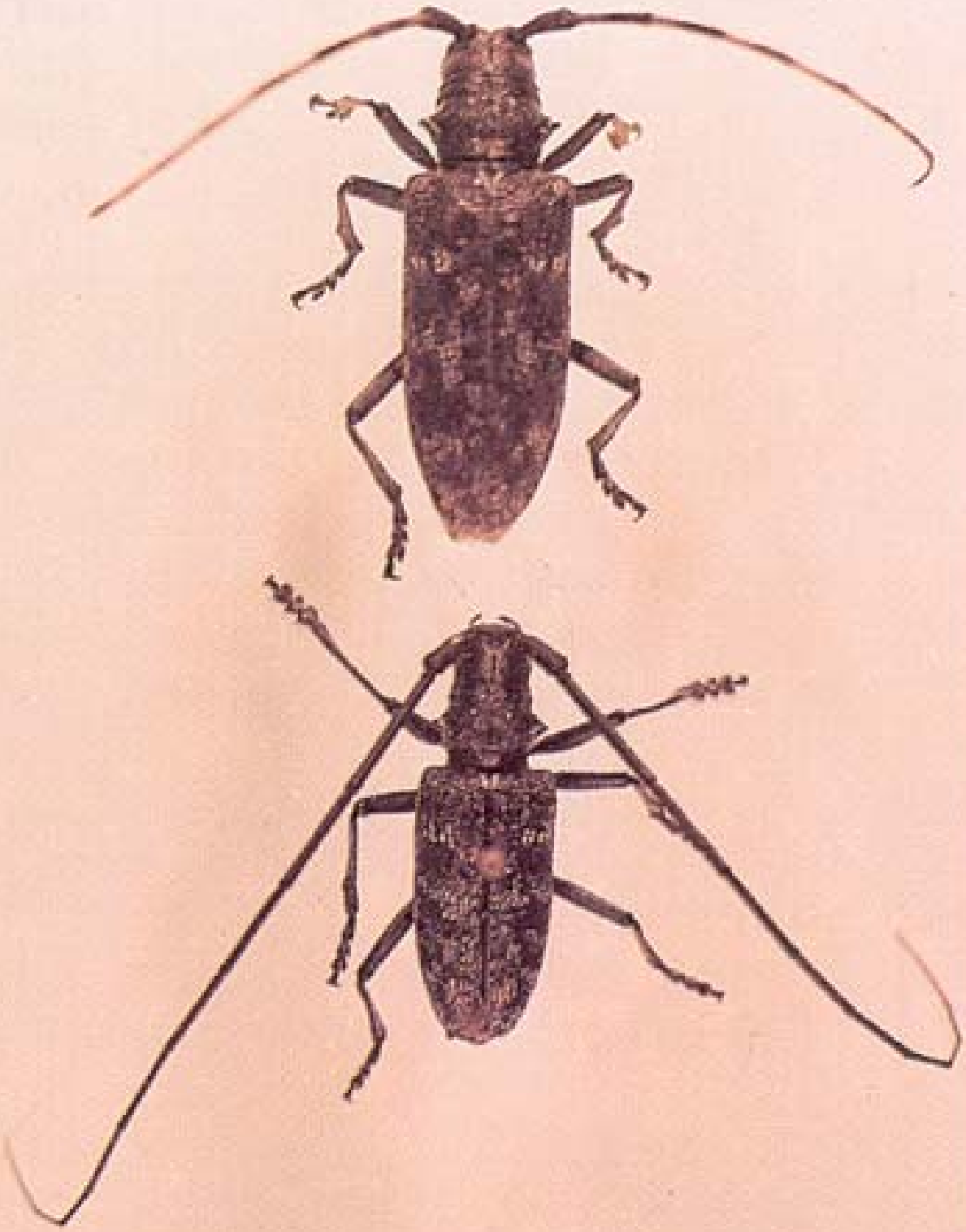
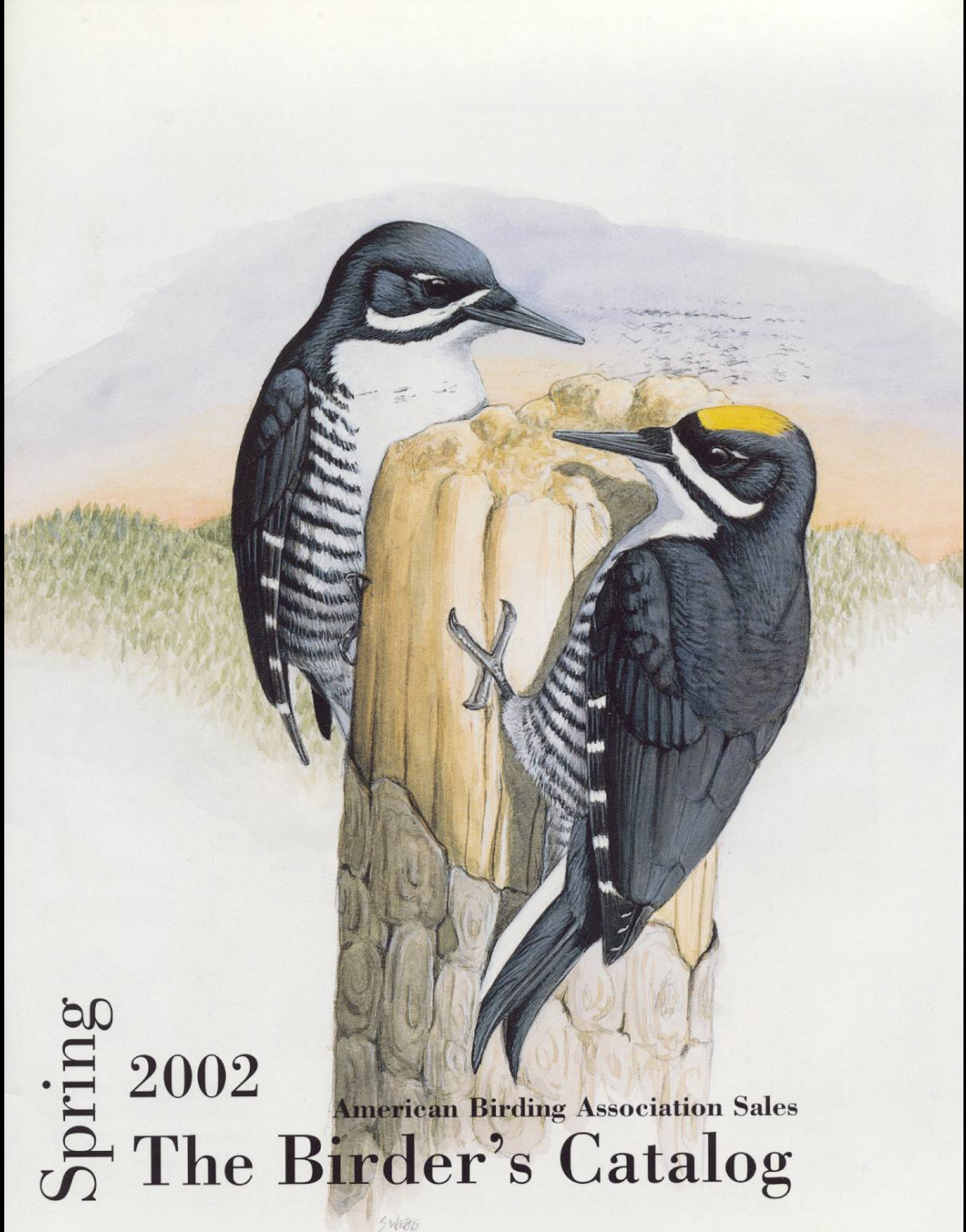
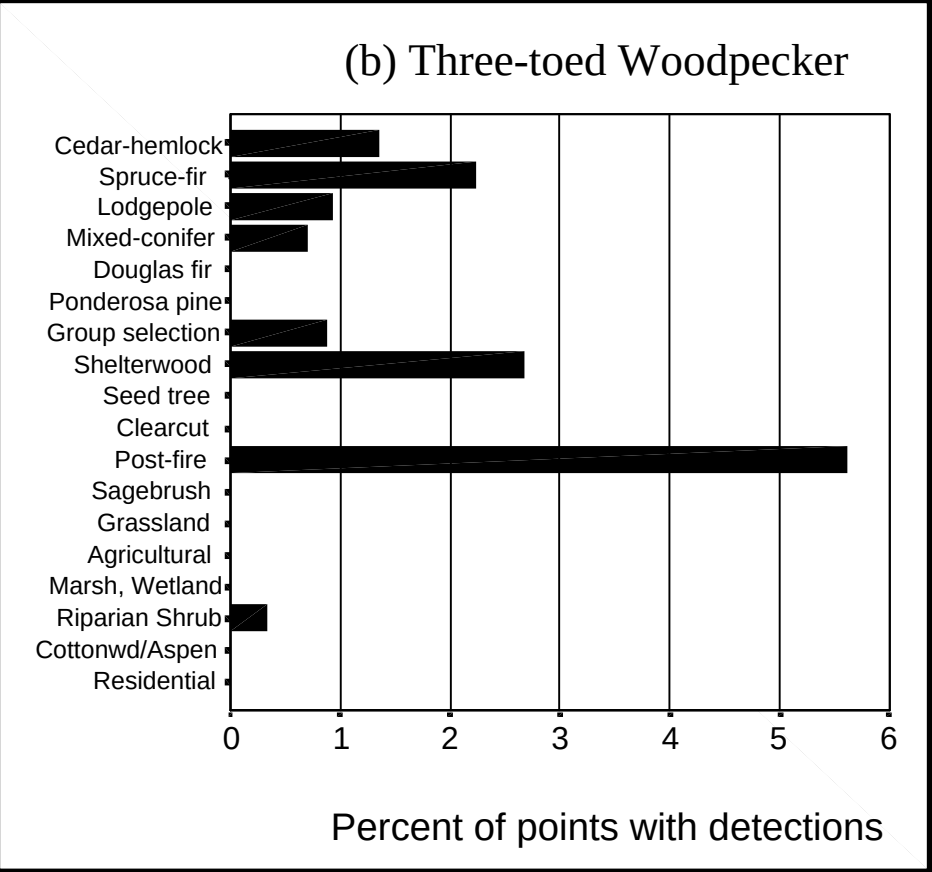


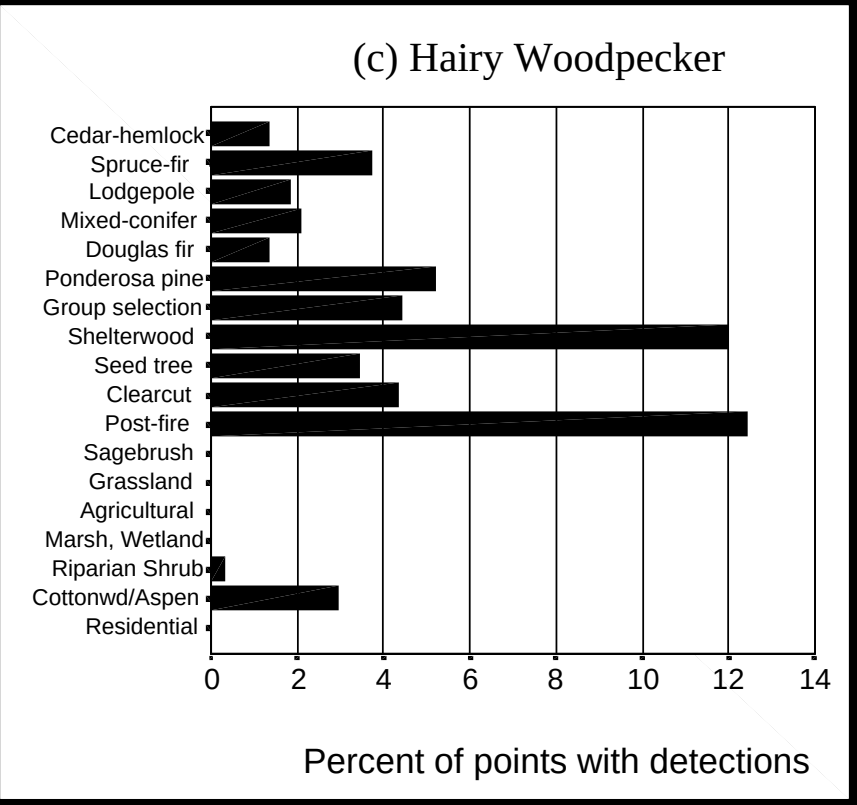


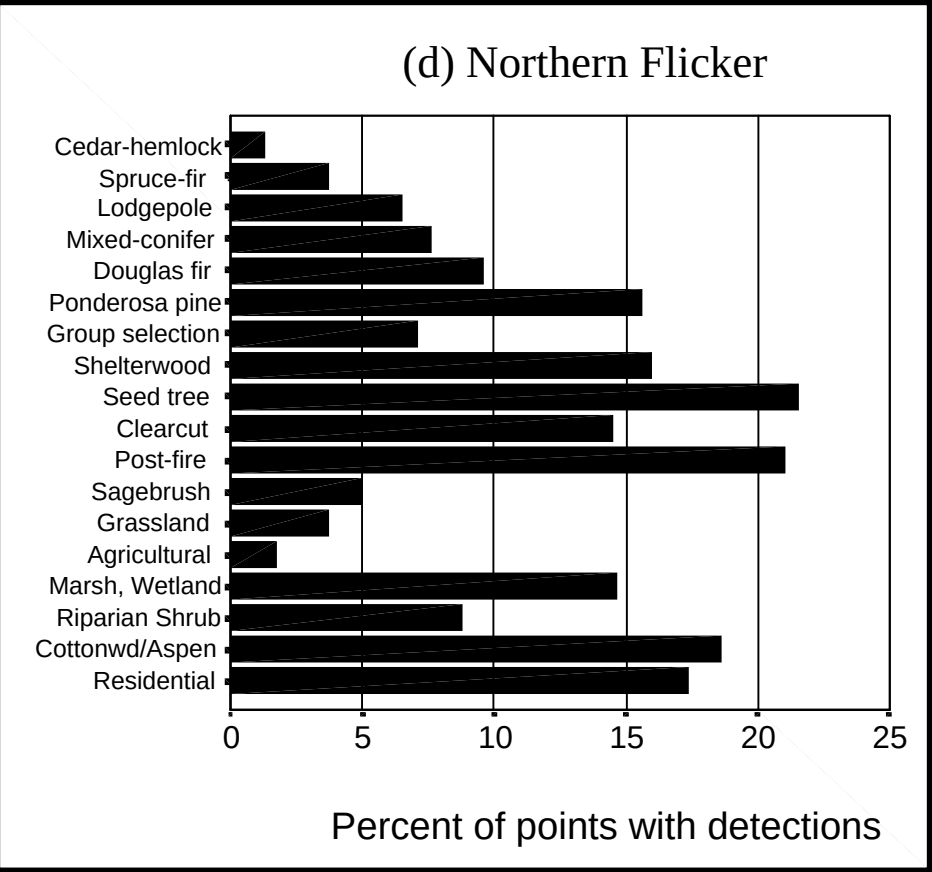
Spring 2002

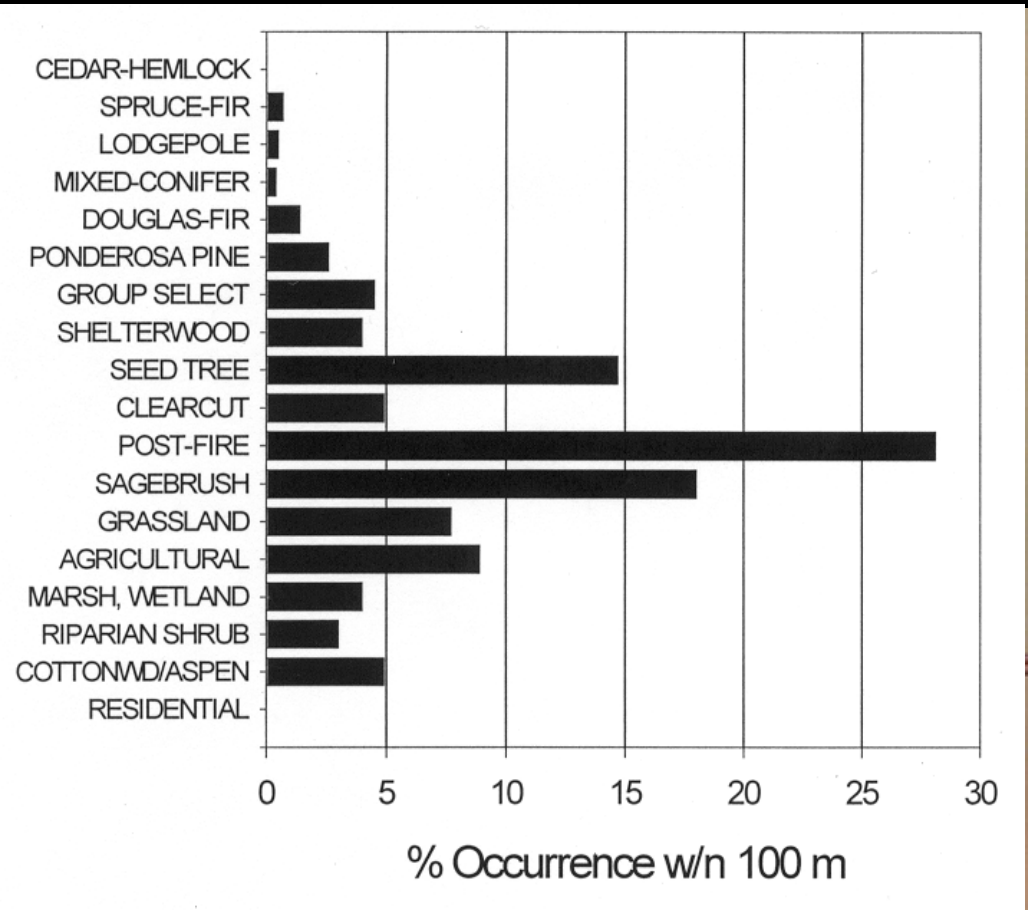
American Birding Association Sales

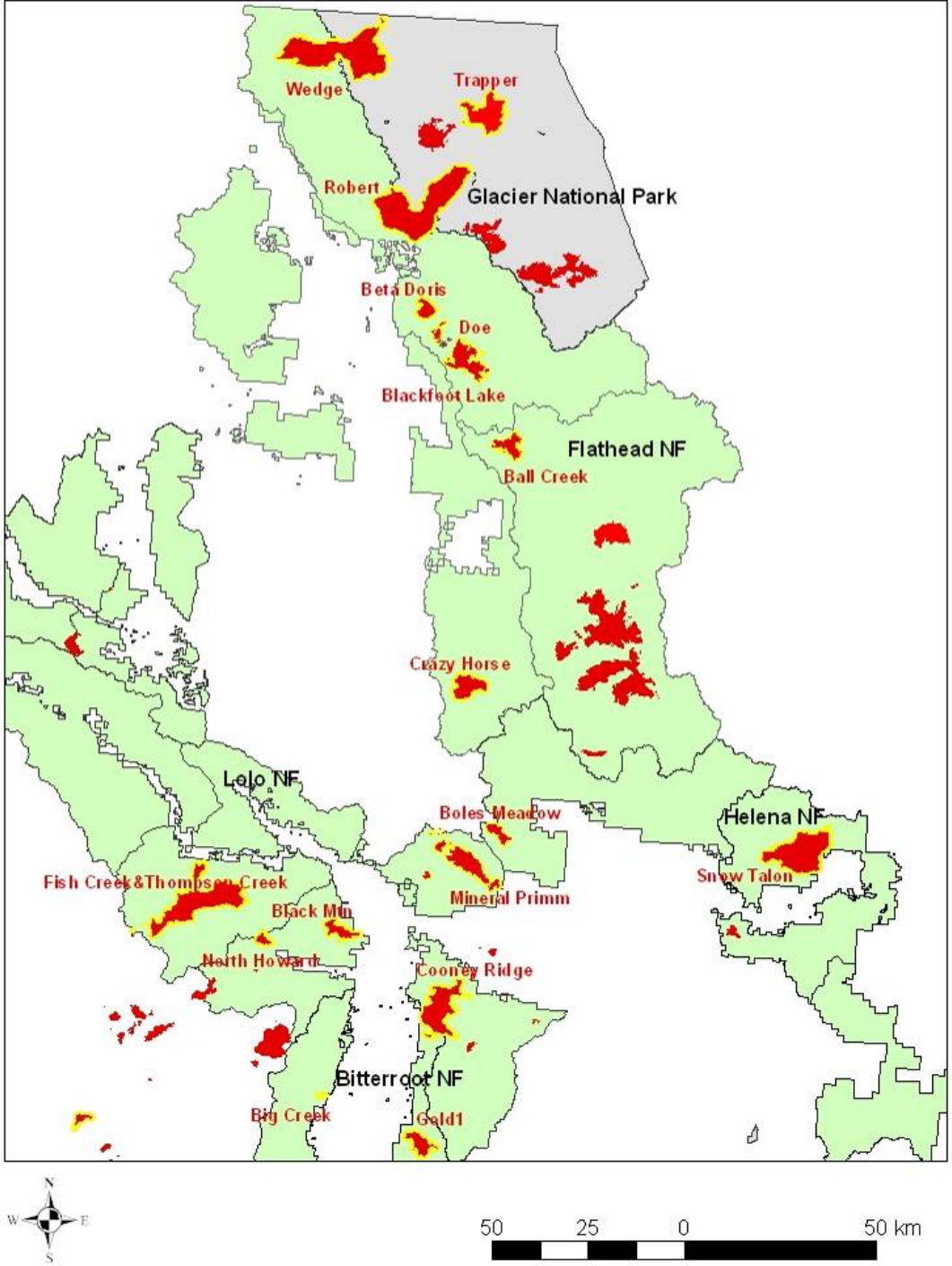
The Birder's Catalog

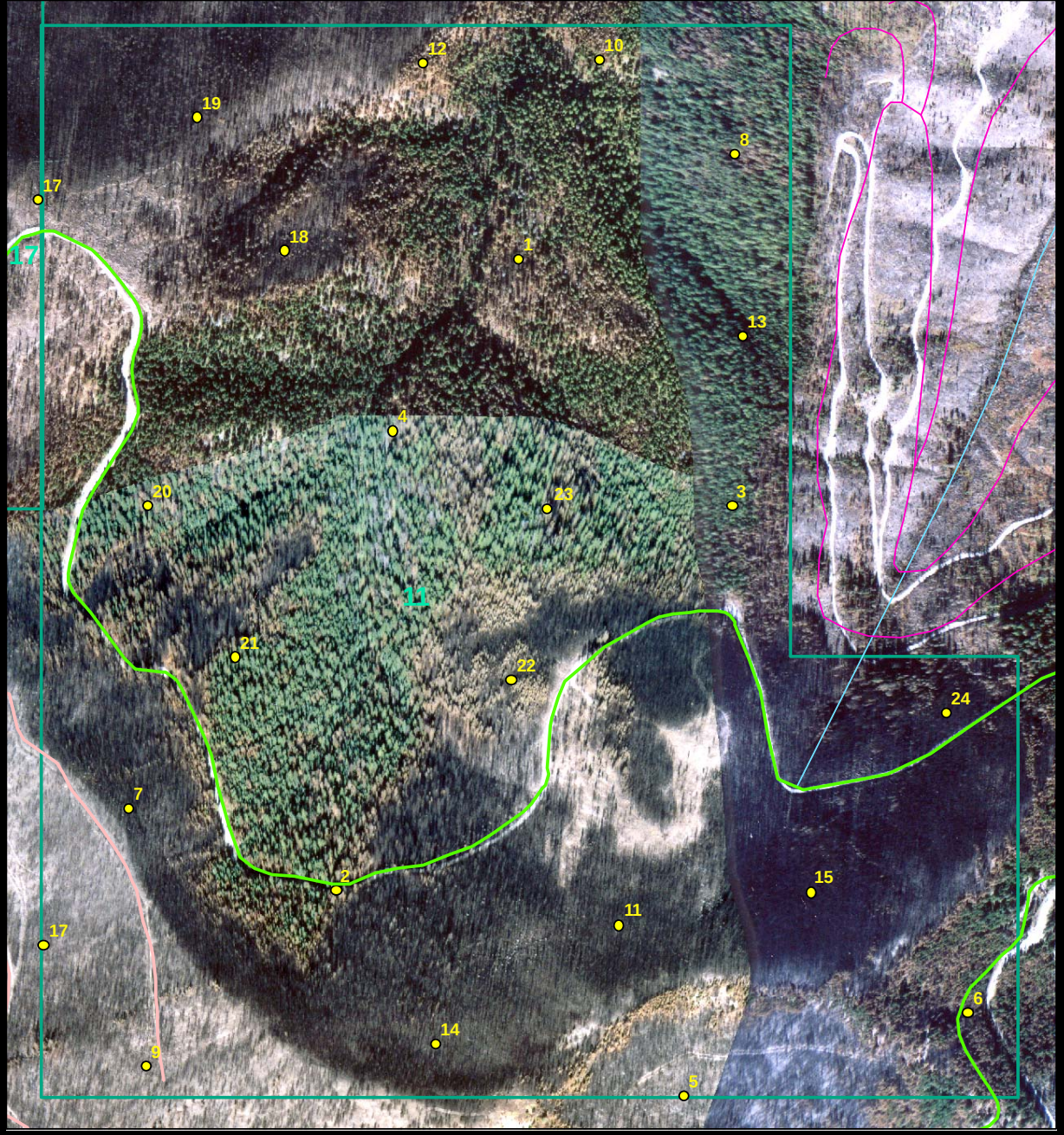

(b) Three-toed Woodpecker
Cedar-hemlock
Spruce-fir
Lodgepole
Mixed-conifer
Douglas fir
Ponderosa pine
Group selection
Shelterwood
Seed tree
Clearcut
Post-fire
Sagebrush
Grassland
Agricultural
Marsh, Wetland
Riparian Shrub
Cottonwd/Aspen
Residential
0
1
2
3
4
5
6
Percent of points with detections


(c) Hairy Woodpecker
Cedar-hemlock
Spruce-fir
Lodgepole
Mixed-conifer
Douglas fir
Ponderosa pine
Group selection
Shelterwood
Seed tree
Clearcut
Post-fire
Sagebrush
Grassland
Agricultural
Marsh, Wetland
Riparian Shrub
Cottonwd/Aspen
Residential
0
2
4
6
8
10
12
14
Percent of points with detections


(d) Northern Flicker
Cedar-hemlock
Spruce-fir
Lodgepole
Mixed-conifer
Douglas fir
Ponderosa pine
Group selection
Shelterwood
Seed tree
Clearcut
Post-fire
Sagebrush
Grassland
Agricultural
Marsh, Wetland
Riparian Shrub
Cottonwd/Aspen
Residential
0
5
10
15
20
25
Percent of points with detections


CEDAR-HEMLOCK
SPRUCE-FIR
LODGEPOLE
MIXED-CONIFER
DOUGLAS-FIR
PONDEROSA PINE
GROUP SELECT
SHELTERWOOD
SEED TREE
CLEARCUT
POST-FIRE
SAGEBRUSH
GRASSLAND
AGRICULTURAL
MARSH, WETLAND
RIPARIAN SHRUB
COTTONWD/ASPEN
RESIDENTIAL
0
5
10
15
20
25
30
% Occurrence w/n 100 m


Wedge
Trapper
Robert
Glacier National Park
Beta Doris
Doe
Blackfoot Lake
Flathead NF
Ball Creek
Crazy Horse
Lolo NF
Boles Meadow
Helena NF
Snow Talon
Fish Creek&Thompson Creek
Mineral Primm
Black Mtn
North Howard
Cooney Ridge
Bitterroot NF
Big Creek
Gold1
N
W
E
S
50
25
0
50 km


12
10
19
8
17
18
1
17
13
4
20
23
3
11
21
22
24
7
2
15
11
17
6
14
9
5

5 fire severity classes

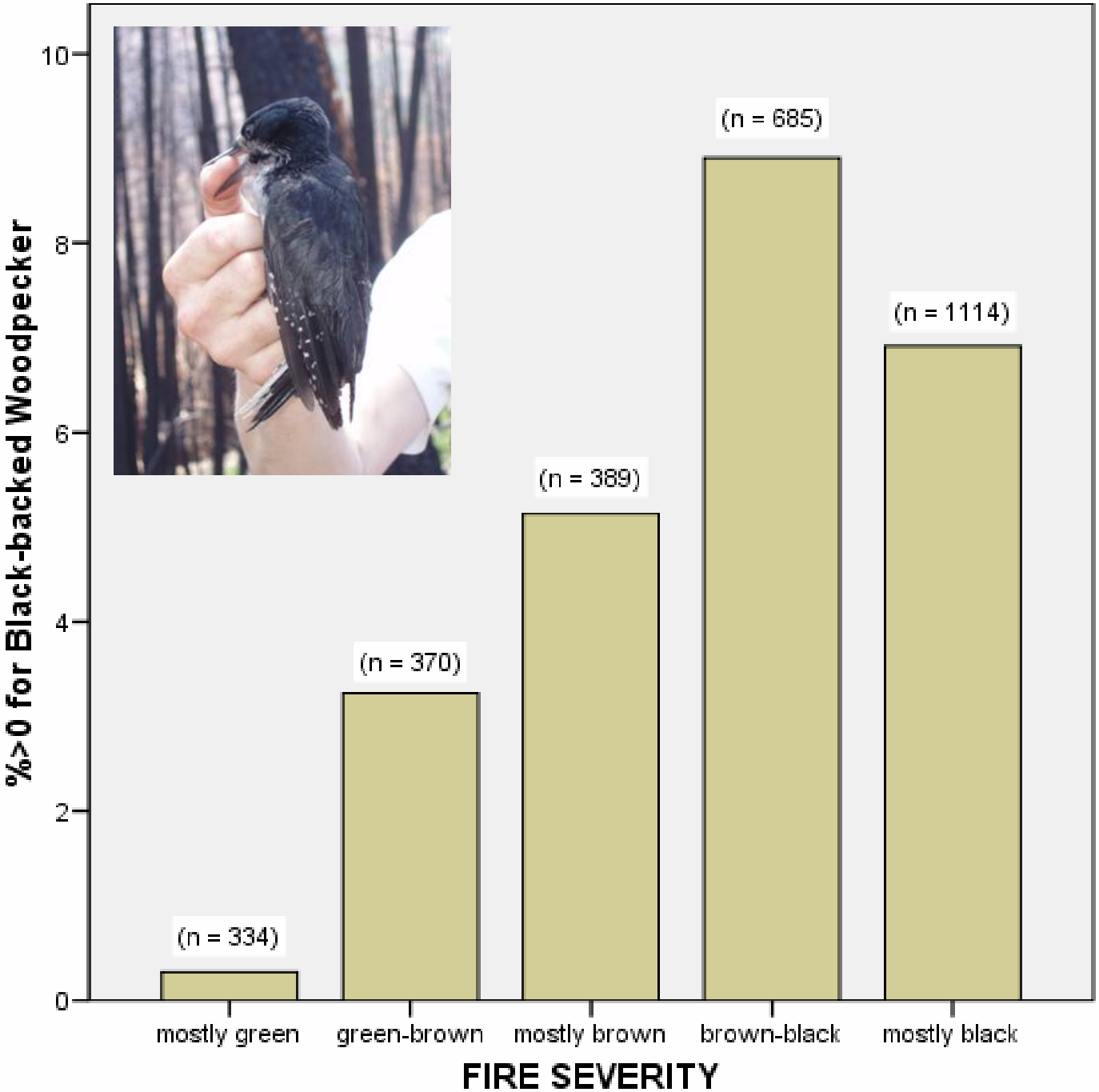
green-brown

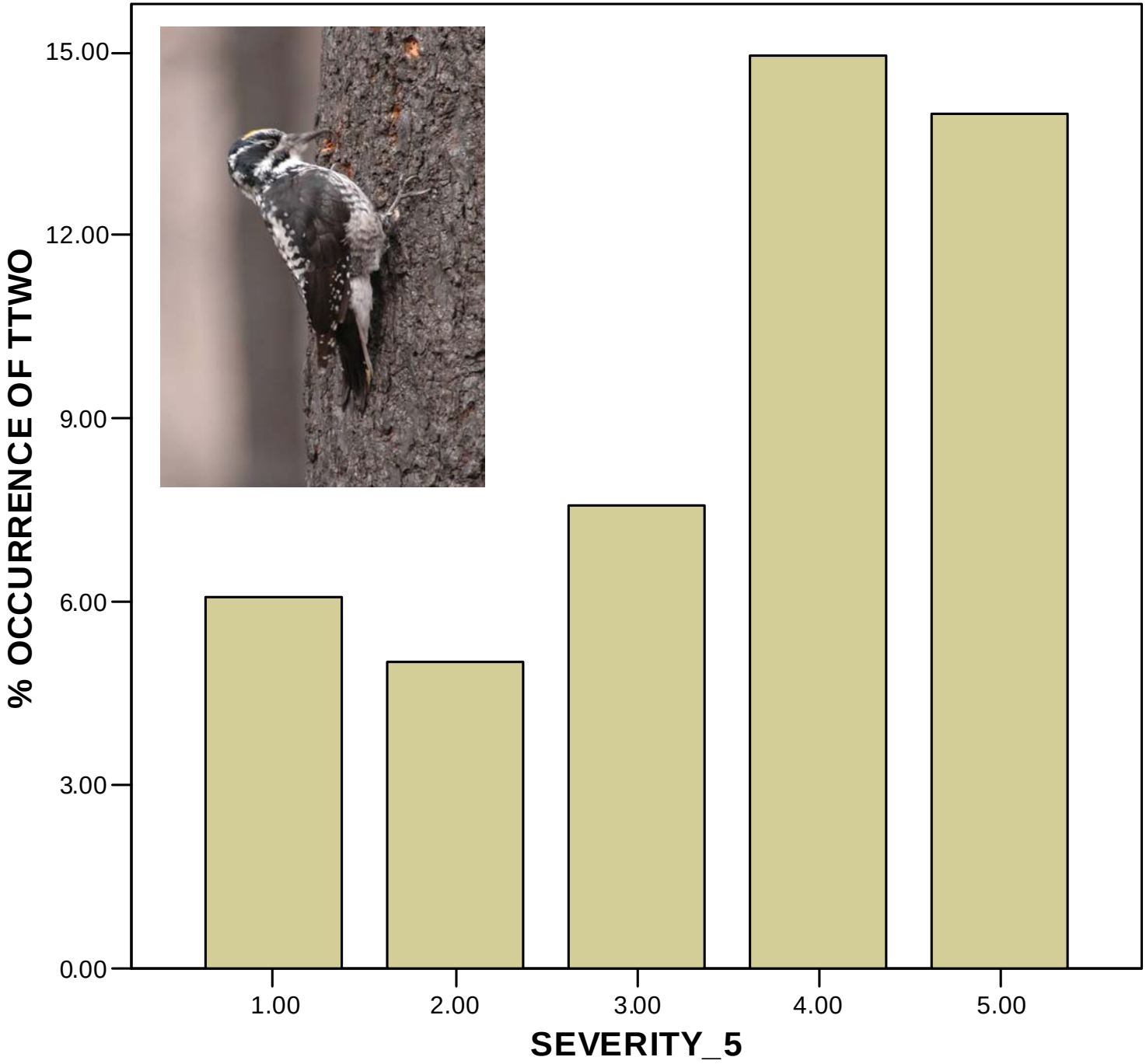
brown-black

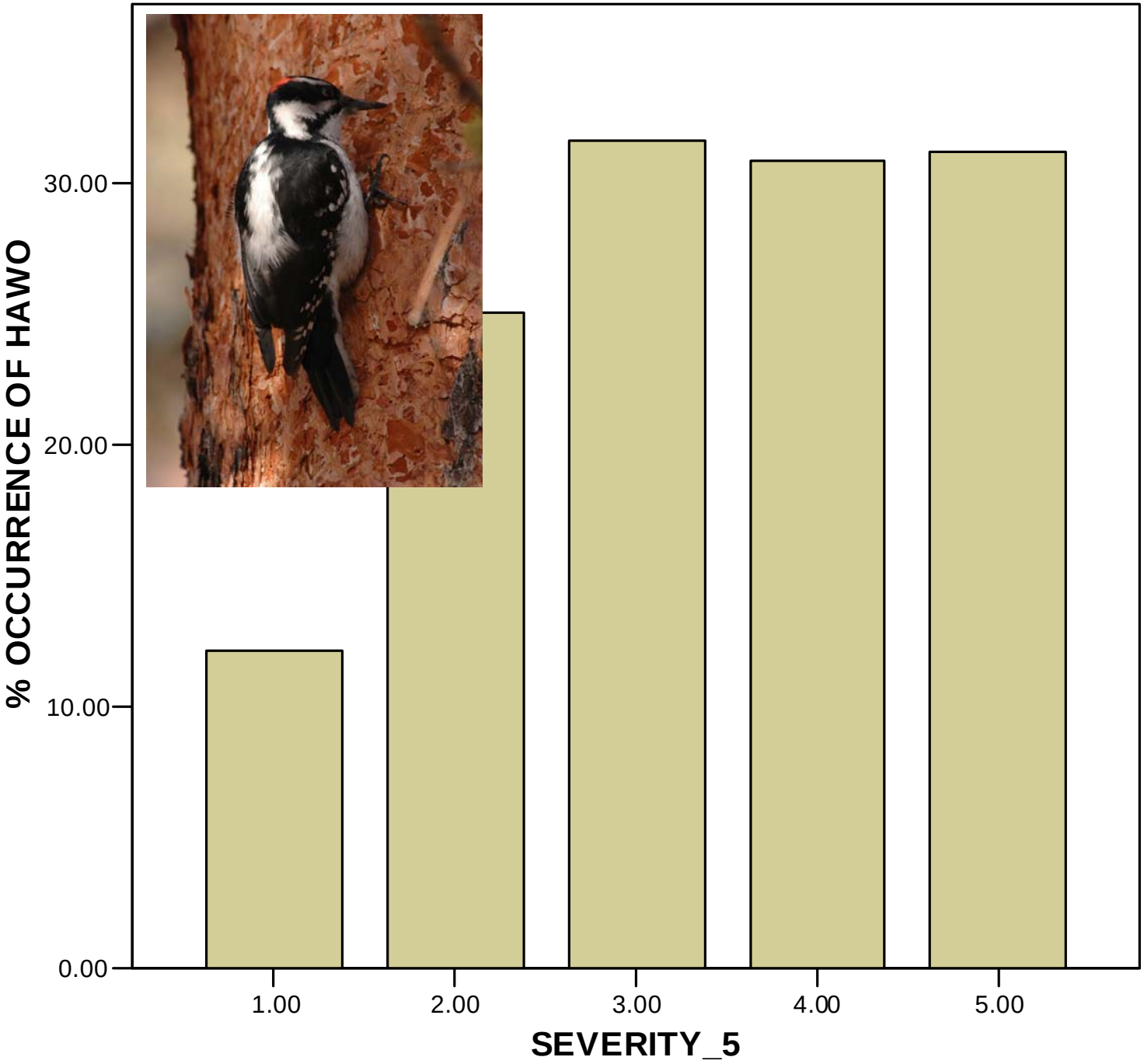
mostly green

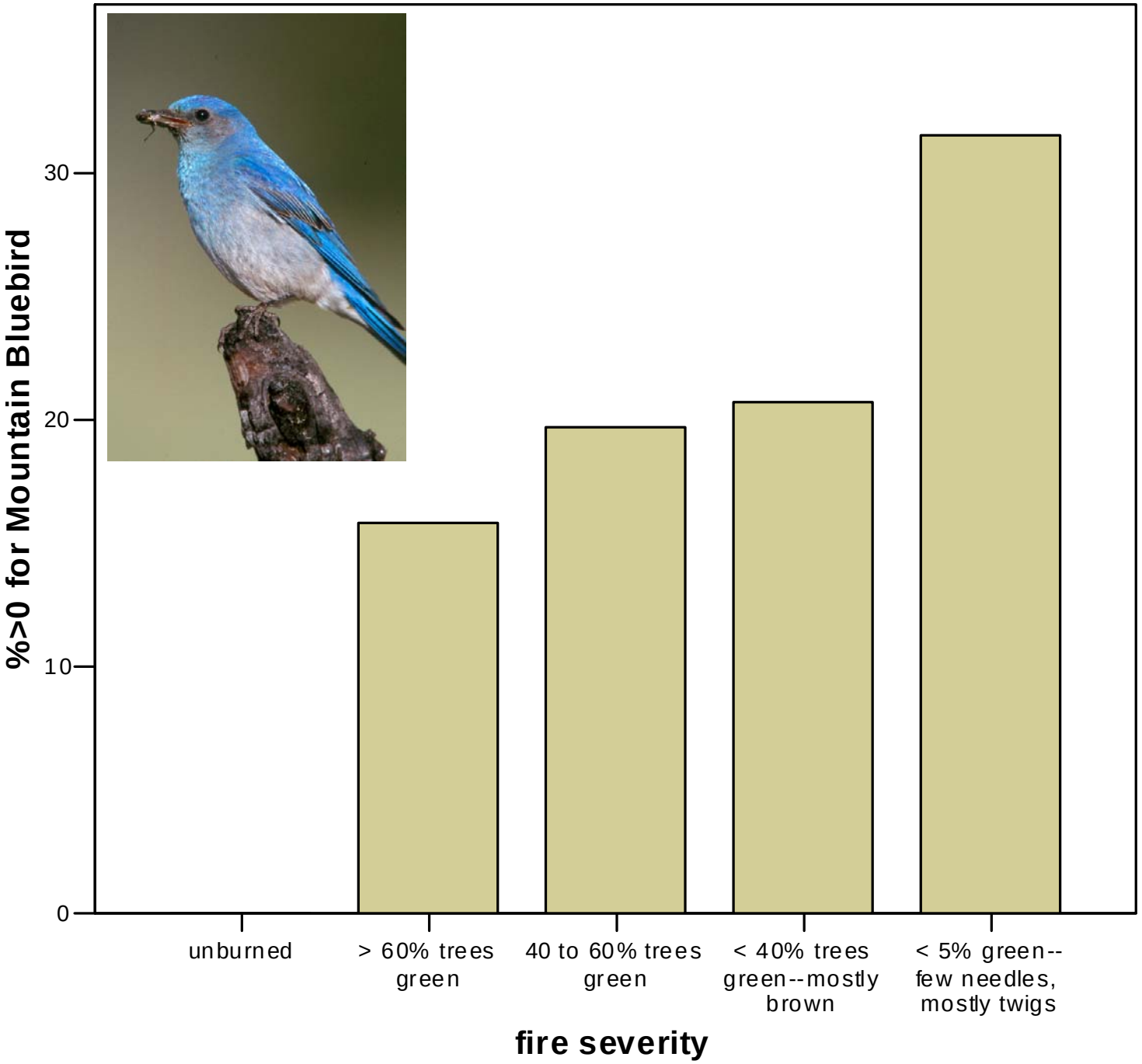
mostly brown

mostly black


%>0 for Black-backed Woodpecker
10
8
6
4
2
0
(n = 334)
(n = 370)
(n = 389)
(n = 685)
(n = 1114)
mostly green
green-brown
mostly brown
brown-black
mostly black
FIRE SEVERITY


% OCCURRENCE OF TTWO
15.00
12.00
9.00
6.00
3.00
0.00
1.00
2.00
3.00
4.00
5.00
SEVERITY_5


% OCCURRENCE OF HAWO
30.00
20.00
10.00
0.00
1.00
2.00
3.00
4.00
5.00
SEVERITY_5


%>0 for Mountain Bluebird
30
20
10
0
unburned
> 60% trees green
40 to 60% trees green
< 40% trees green--mostly brown
< 5% green--few needles, mostly twigs
fire severity

Understand this correctly!

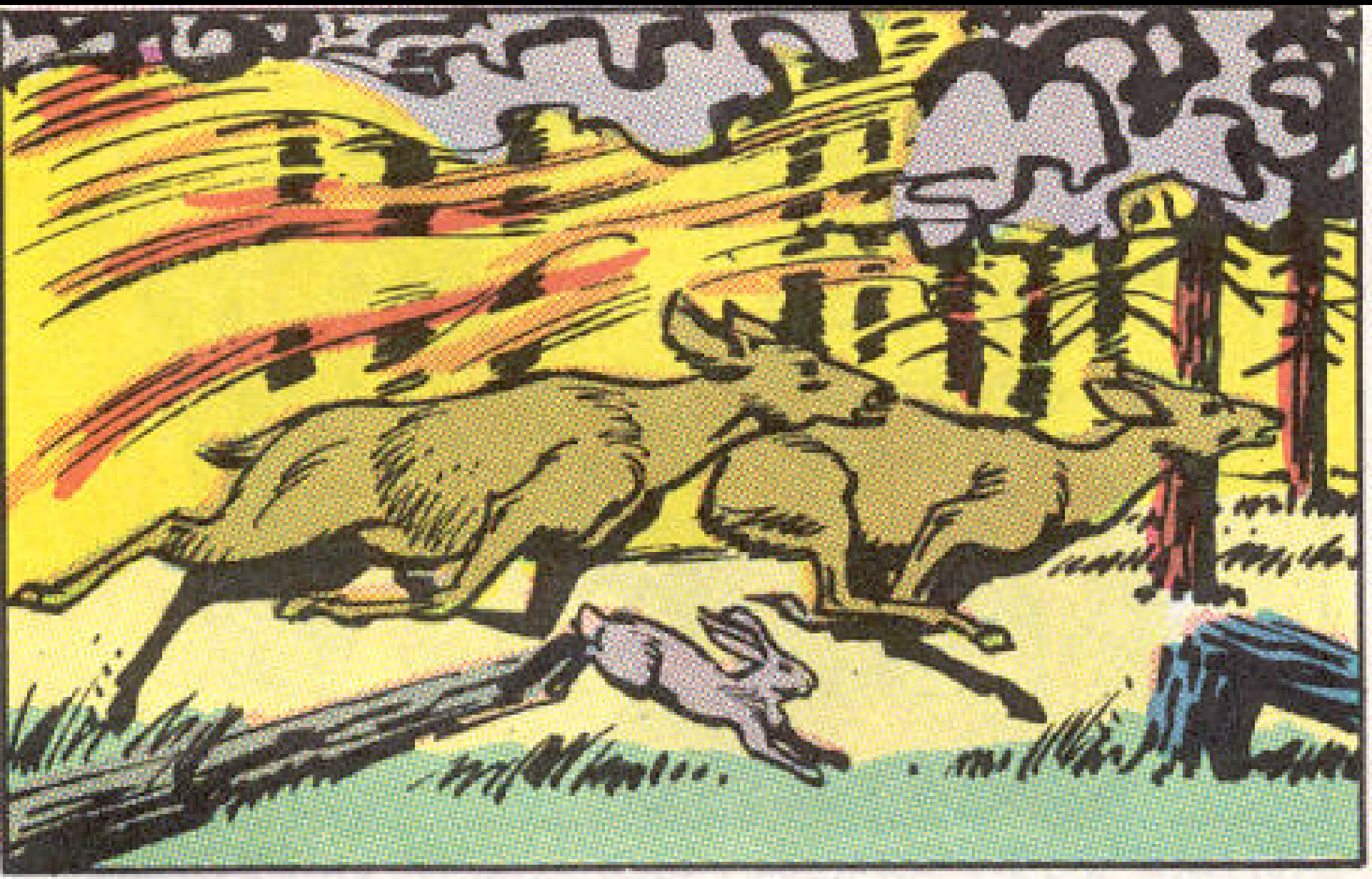
It’s not that many organisms are able to SURVIVE severe fires; it’s that they REQUIRE severely burned forest conditions to survive.

Remember—**Only you can**

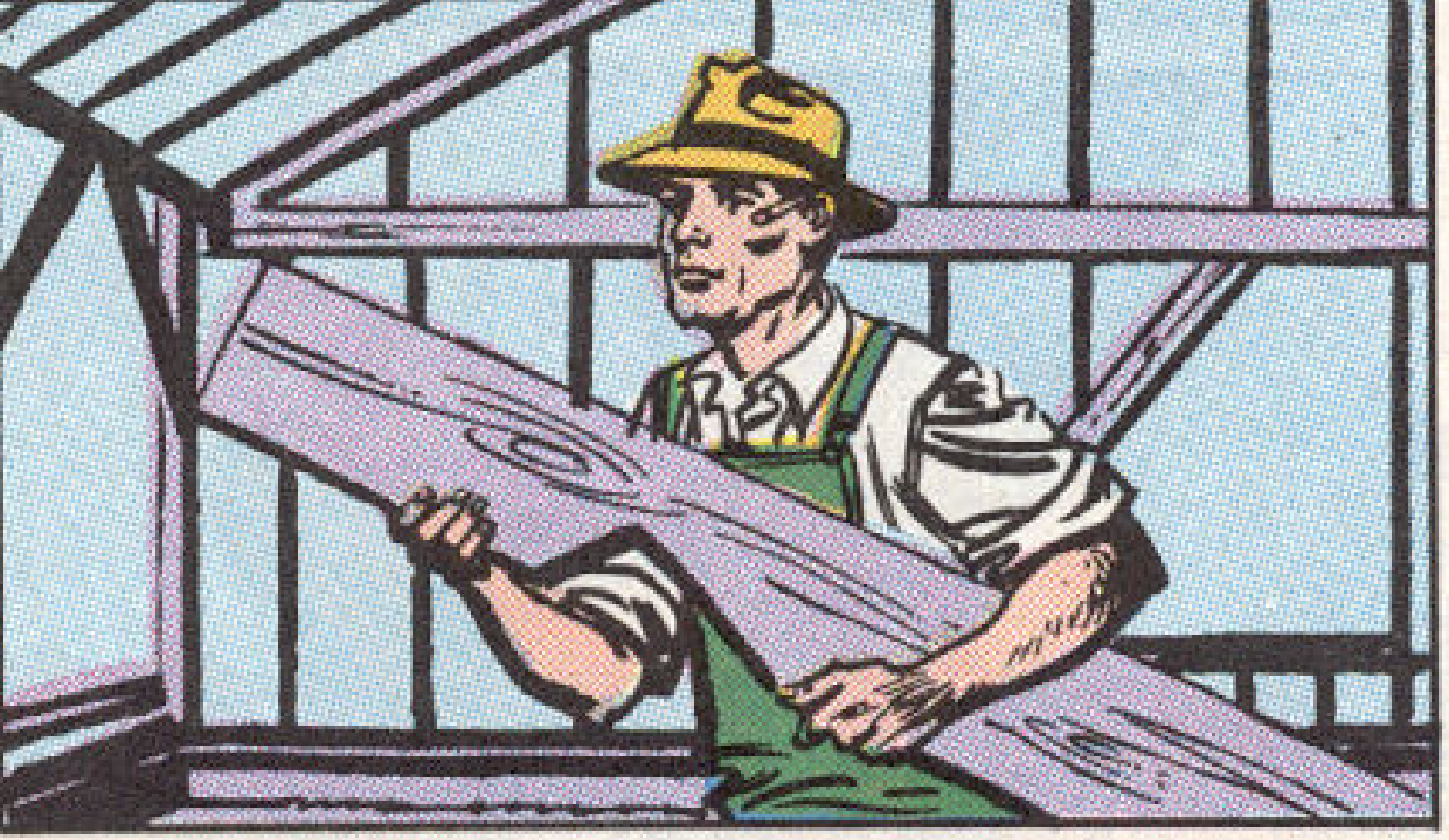
PREVENT THE MADNESS!

"AS SMOKEY GREW UP, HE HAD SOMETHING TO TELL FOLKS--AND HE ***STILL*** TELLS THEM THE SAME THING!

"SMOKEY TELLS THEM HOW
HE HATES FOREST FIRES!



"HOW THEY DESTROY HIS ANIMAL FRIENDS...



"HOW THEY BURN UP TIMBER THAT COULD HAVE BEEN USED TO MAKE HOMES -- PERHAPS, A NEW HOME FOR YOU...

"HOW THEY WASTE WOOD THAT COULD HAVE GONE INTO FURNITURE...

"OR EVEN TO MAKE PAPER TO PRINT COMIC BOOKS ON!

UNFORTUNATELY, THEY CAN'T RUN FOR THEIR LIVES.
SMOKEY
ONLY YOU CAN PREVENT FOREST FIRES.
Ad Council
80332
LAMAR

Although the chemical reaction known as fire is inherently neither good nor bad, the circumstances surrounding its ignition, its burn rate, its location, and its intensity are.

Prescribed Fires are Good Fires.

As one of the most important natural agents of change, fire plays a vital role in maintaining healthy ecosystems. Prescribed fire reintroduces the beneficial effects of fire into an ecosystem, producing the kinds of vegetation and landscapes we want, and reducing the hazard of catastrophic wildfire caused by excessive fuel buildup. Learn More about Prescribed Fire

Wildfires are Bad Fires.

They destroy wilderness, property, and lives. As more homes are built in and around forested areas, and as more people take to our country's wildland areas, wildfires are also on the rise. Through discarded smoking products, sparks from equipment in operation, arced powerlines, campfires, arson, debris burning and other careless means, wildfires are often ignited, and its fires such as these – unplanned, uncontrolled and unnecessary – that could be most easily prevented. Learn More

Find Out More

- USDA Forest Service – Wildland Fire Use
  Wildland fire management, its history, and reasons for its use.
  www.fs.fed.us/fire/fire_new/fireuse/wildland_fire_use/use_index.html
- The Forest History Society
  Detailing the history of interaction between people and the forests that surround them.
  www.lib.duke.edu/forest/
- Wildland Fire in Yellowstone
  Learn about the natural effects of fire on Yellowstone's ecosystem.
  www.nps.gov/yell/technical/fire/
- About Forestry
  Fire's ongoing role in our forest's natural ecosystem.
  forestry.about.com/library/weekly/aa080397.htm
- NOVA – Fire Wars
  How plants and other living organisms use fire.
  www.pbs.org/wgbh/nova/fire/plants.html

ZONA FORESTAL
APAGA EL FUEGO
EN CASO DE INCENDIO LLAMAR A
393907 SARH GUADALAJARA
80003 SARH AMECA
60088 SARH MASCOTA
60366 UCDF MASCOTA SC.

EL BOSQUE ES TUYO
NO LO DESTRUYAS
APAGA TU FOGATA
EN CASO DE INCENDIO LLA
-MAR A LOS TELS:
UCDF
SARH
60366 MASCOTA.
60088 MASCOTA.
80003 AMECA.
393907 GUAD.

Severe fires are “unnatural”

“It’s critically important to recognize that the most significant environmental problem facing forests is the risk of catastrophic fire.” **(David Bischel, President, California Forestry Association, Missoulian, 12 December 2002)**

“Nearly a century of well-intended fire suppression has created millions of acres of unnaturally dense forest ripe for catastrophic wildfires.” **(Missoulian ed., 7 July 2004)**

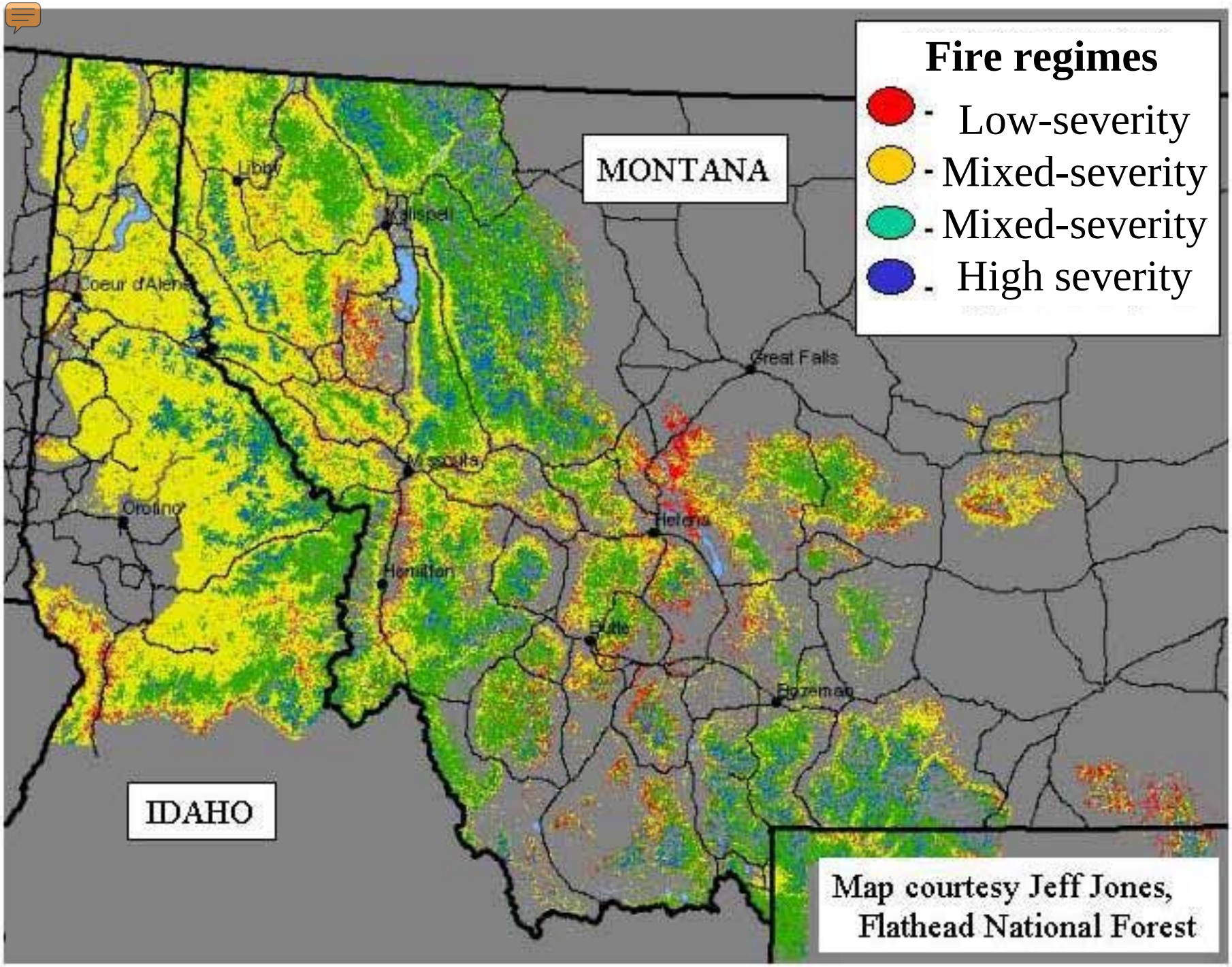
The *severity* of fires that we see burning in most western forest types is still well within the historical range of variation (Romme 1982, Johnson et al. 2001, Baker et al. 2007); it's primarily the *extent* of such fires that may lie outside the HRV.

Arno and Fiedler (2005)

Table 3.1.

Western forest types and their historical fire regimes. Abridged from Arno (2000), and pinyon-juniper from Paysen and others (2000). "M" indicates a major part of the forest type; "m" signifies a smaller representation.

Historical Forest Type	Fire Regime Type		
	Understory	Mixed	Stand Replacement
Avg. interval between fires (years)	*1–30*	*30–100*	*100–400*
Coastal subalpine forest			M
Douglas-fir, coastal		M	M
Douglas-fir, inland	m	M	
Giant sequoia-mixed conifer	M	m	
Hemlock-Sitka spruce			M
Lodgepole pine		M	M
Oregon white oak	M		
Pinyon-juniper	m	M	m
Ponderosa pine, east of continental divide	m	M	m
Ponderosa pine, west of continental divide	M	m	
Quaking aspen	m	M	
Redwood	M	m	
W. white pine-cedar-hemlock		M	M
Western larch		M	M
Whitebark pine		M	M


Fire regimes
Low-severity
Mixed-severity
Mixed-severity
High severity
MONTANA
IDAHO
Libby
Kalispell
Coeur d'Alene
Great Falls
Missoula
Orofino
Helena
Hamilton
Butte
Bozeman
Map courtesy Jeff Jones,
Flathead National Forest

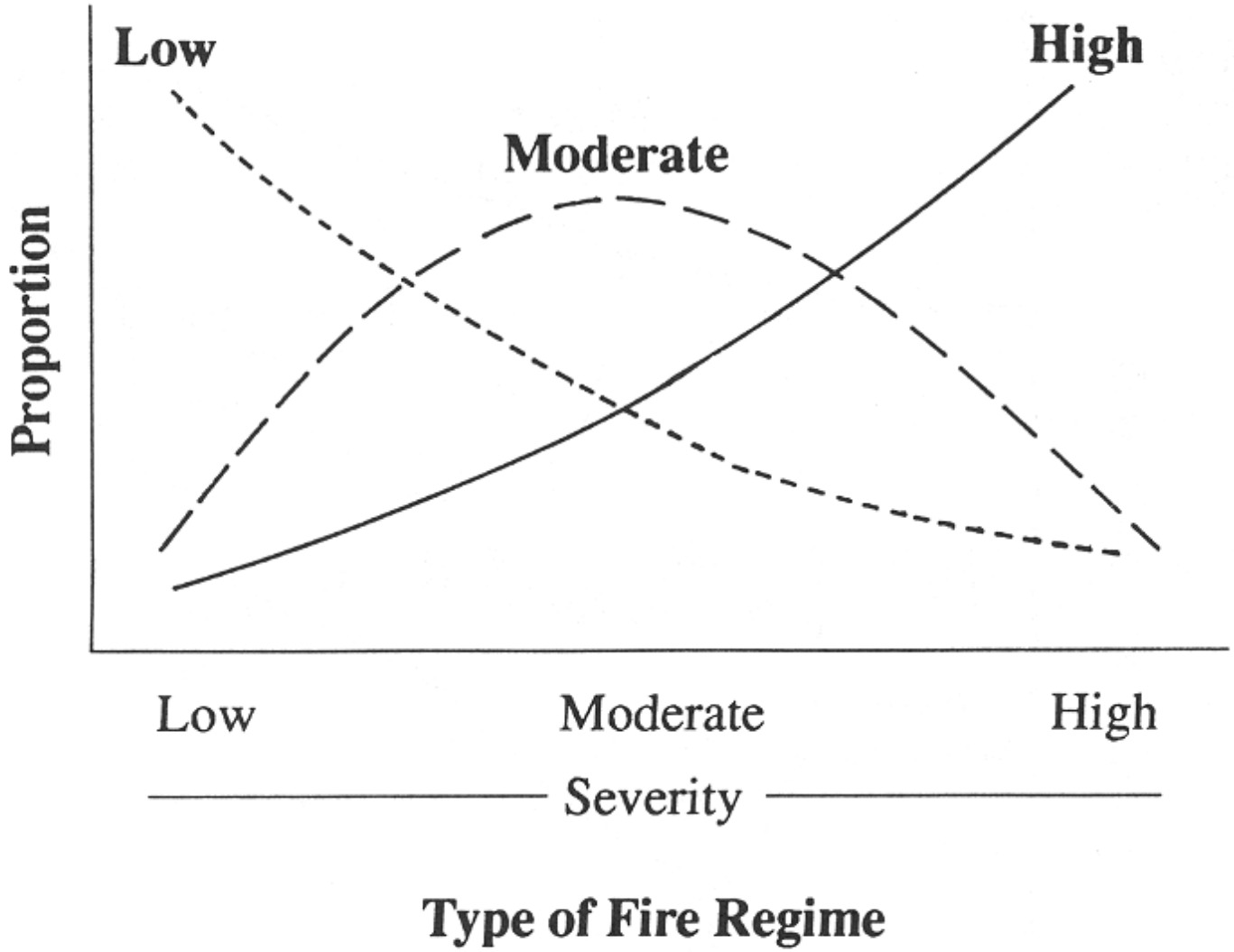


FIG. 1.6. *Variation in fire severity within a general fire-severity type. The general fire-severity types differ in the proportion of each fire-severity level present, with the moderate severity fire regime having the most complex mix of low, moderate, and high severity fires.*

(from Agee 1993)

Even in ponderosa pine forests, there's a growing body of evidence that high-severity fire events are perfectly natural, albeit rare, occurrences (Agee 1993, Brown and Sieg 1996, Arno et al. 1997, Shinneman and Baker 1997, Brown et al. 1999, Veblen 2000, Ehle and Baker 2003, Schoennagel et al. 2004).

Although crown fires may not be the most frequent kind of fire everywhere, they occur naturally in *all* western forest types

Unfortunately, the public has been led to believe that crown fires are “unnatural”

The public-at-large is almost entirely unaware of the benefits associated with severe crown fires

13 Oct '01

Forest management

Face the facts, some fires are bad

People who write letters to the editor stating disregard for science and who show blind commitments desperately need to become educated, instead of being programmed.

The people who say all fires are good for the forest are totally disregarding the catastrophic fires, which burn so hot and deep that the ground is sterile and will not rejuvenate for decades.

These are the folks using junk science we are supposed to embrace. The burned snags left standing are in no way good or healthy.

The letters said logging, road building, and grazing areas are where most of these fires occur. The fires

People with political influence continue to make statements suggesting that *severe fire itself* is unnatural:

Jerry Williams (USFS Region 1 fire manager) says "*…we can't just let nature take its course because these fires we are seeing today are burning way beyond the adaptive limits of our ecosystems.*" (Missoulian 22 August 2000)

% OCCURRENCE OF BBWO
10.00
8.00
6.00
4.00
2.00
0.00
unburned
<40% blackened trees
40-60% blackened trees
>60% blackened trees
100% blackened trees
FIRE SEVERITY

Beauty mark or scar?

Burned land

6 May '01

Management response was refreshing

I was quite pleased to read the headline in the April 28 Missoulian, "Bitterrooters want action on burned land." I was also pleased to see that a survey had been initiated by the Bitterroot National Forest and that 92 percent of those surveyed felt the U.S. Forest Service should do something with the burned over areas. Eighty-nine and a half percent said it was very important to salvage timber burned in the fires, and 83 percent said it was important to thin trees in

U.S. News
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Politics
U.S. Security
After the Storms
U.S. Life
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U.S. News
World News
Business
Sports

Eco-friendly homes multiply across U.S.

Technology, materials no longer an obstacle to architecture

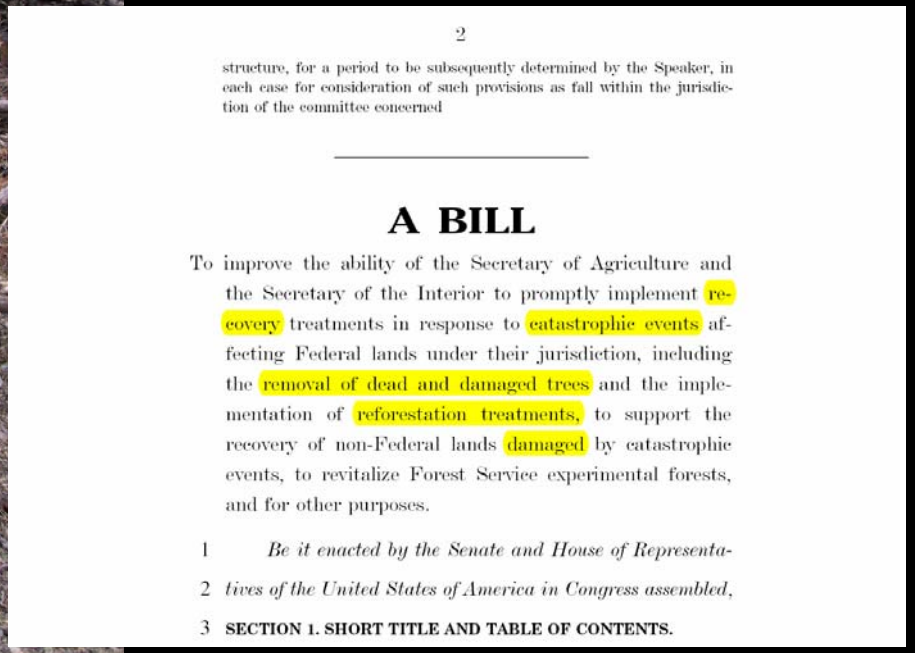
Jake Schoellkopf / AP

This 5,500 square-foot home is being built in Corrales, N.M., using green principles.

By Susan Montoya Bryan (Updated: 10:31 a.m. ET March 27, 2006)

ALBUQUERQUE, N.M. - Norm Schreifels is building a 5,500 square-foot dream home with unimpeded views of the Sandia Mountains, an outdoor dining room that faces the city lights and a handful of plazas and portals that take advantage of New Mexico's weather... **The beams and other wooden accents in Schreifels' home come from timber harvested following a forest fire in northern New Mexico.**

Outside our national parks and wilderness areas, burned forests are often “salvage” logged…and new legislation would expedite such activity.



2

structure, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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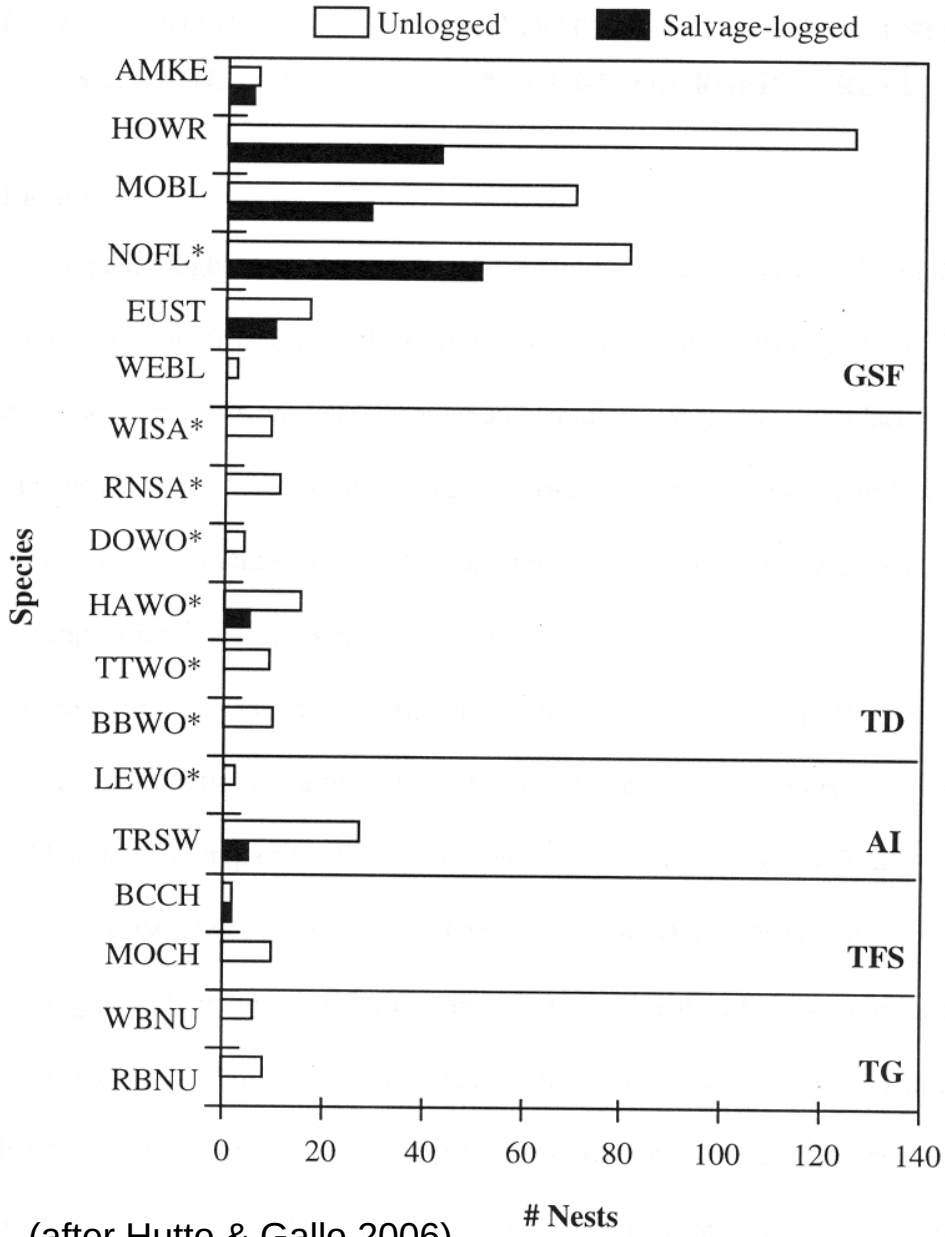
A BILL

To improve the ability of the Secretary of Agriculture and the Secretary of the Interior to promptly implement recovery treatments in response to catastrophic events affecting Federal lands under their jurisdiction, including the removal of dead and damaged trees and the implementation of reforestation treatments, to support the recovery of non-Federal lands damaged by catastrophic events, to revitalize Forest Service experimental forests, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*
3 **SECTION 1. SHORT TITLE AND TABLE OF CONTENTS.**



(after Hutto & Gallo 2006)

The data we collect as scientists will "…make no difference in the conservation of the species and places we care about if this information is not translated into meaningful stories that engage the public and inspire them to take action."

(Brewer 2006)

You can't change fire management policy without educating the public. And to do so, "…facts will not be enough to win popularity; emotional responses need to be excited as well."

(Beardsley 2006)

Thanks for fire research support from:

National Geographic
Yellowstone National Park
Glacier National Park
Teton Science School
North American Bluebird Society
Montana Fish, Wildlife and Parks
MacIntire-Stennis
Champion Timber Company
USFS Region 1 and Forests
USDA Rocky Mountain Research Station
Joint Fire Sciences Program