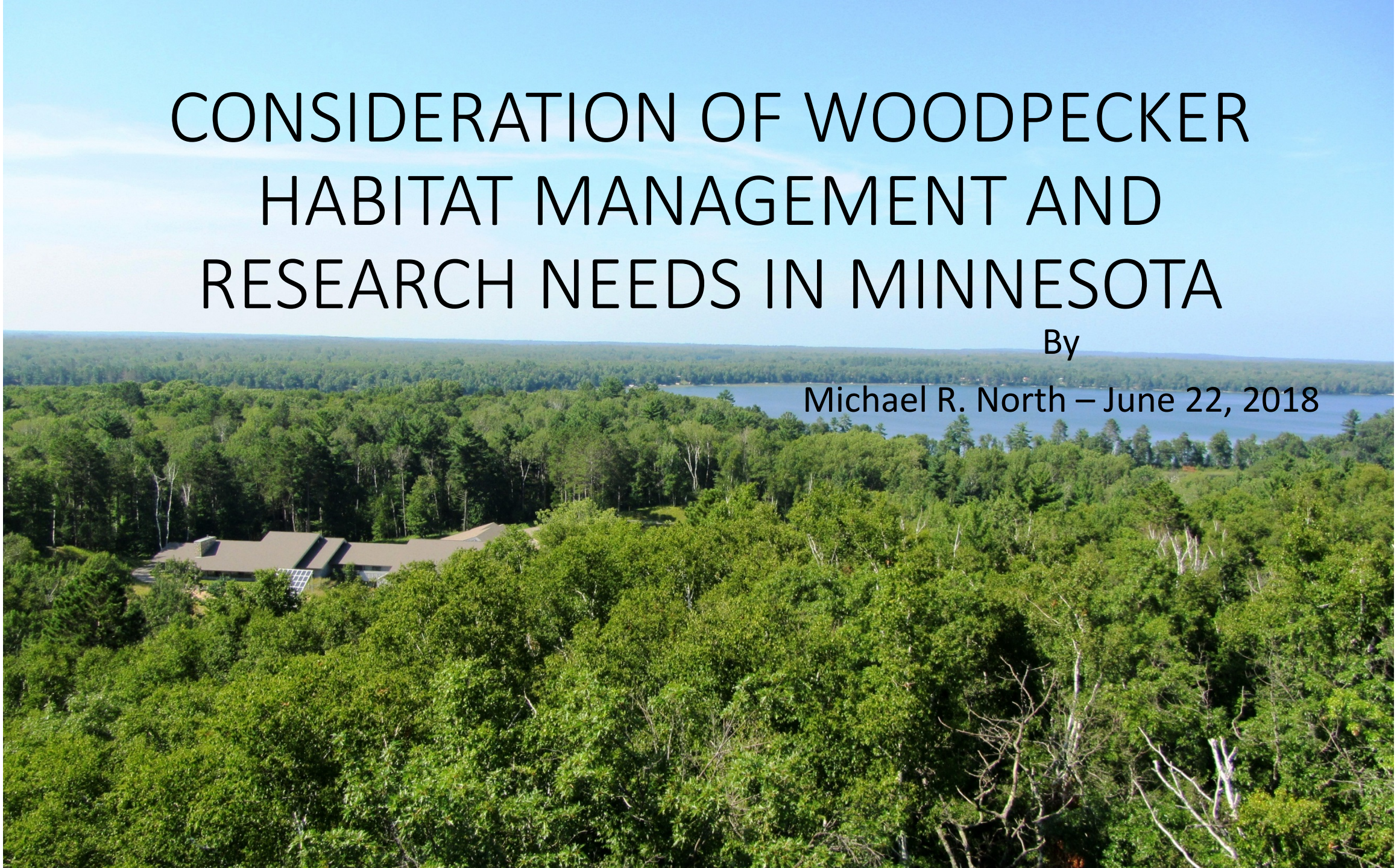
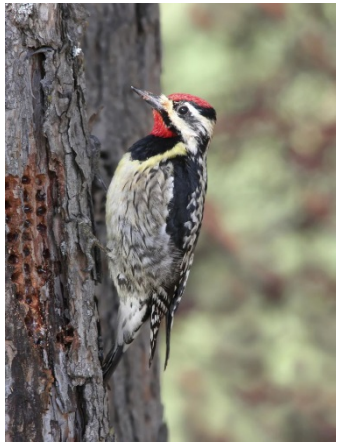
CONSIDERATION OF WOODPECKER HABITAT MANAGEMENT AND RESEARCH NEEDS IN MINNESOTA

By

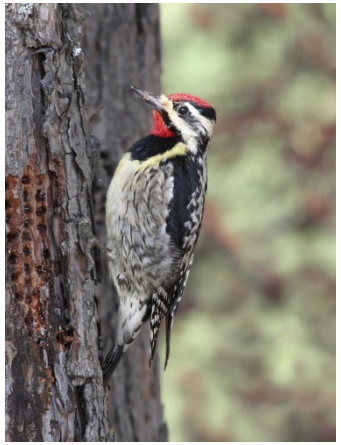
Michael R. North – June 22, 2018



Woodpeckers of Minnesota

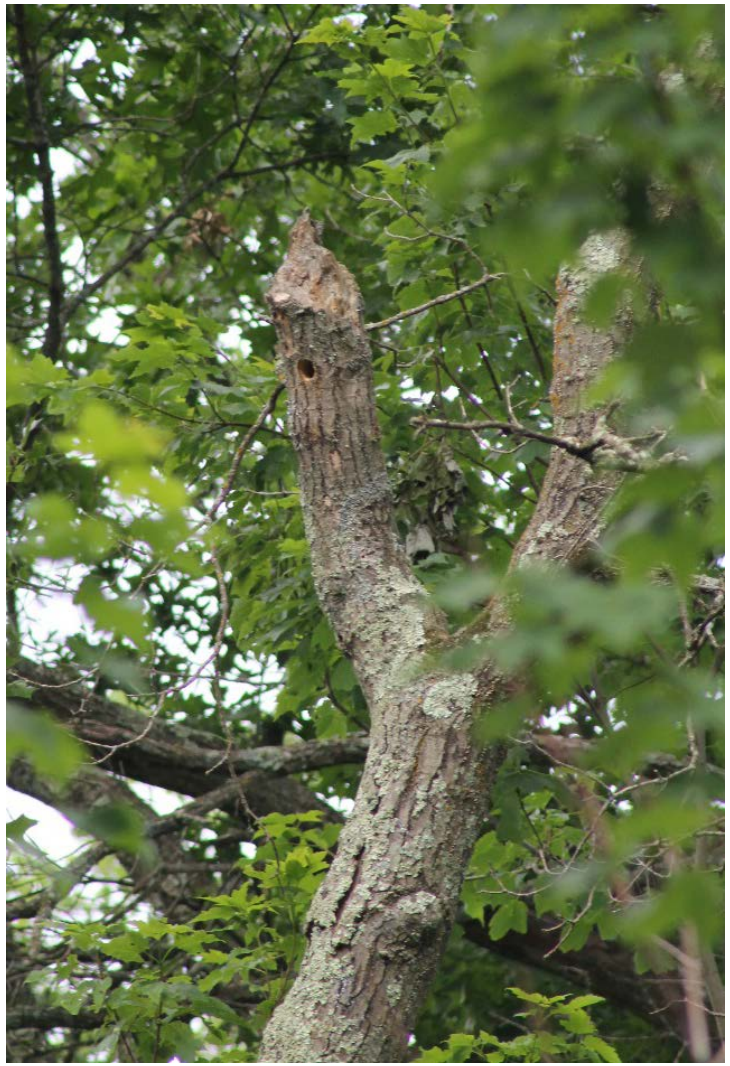


Woodpeckers of Minnesota



Woodpeckers as Ecological Keystone Species

- Roles as Cavity excavators



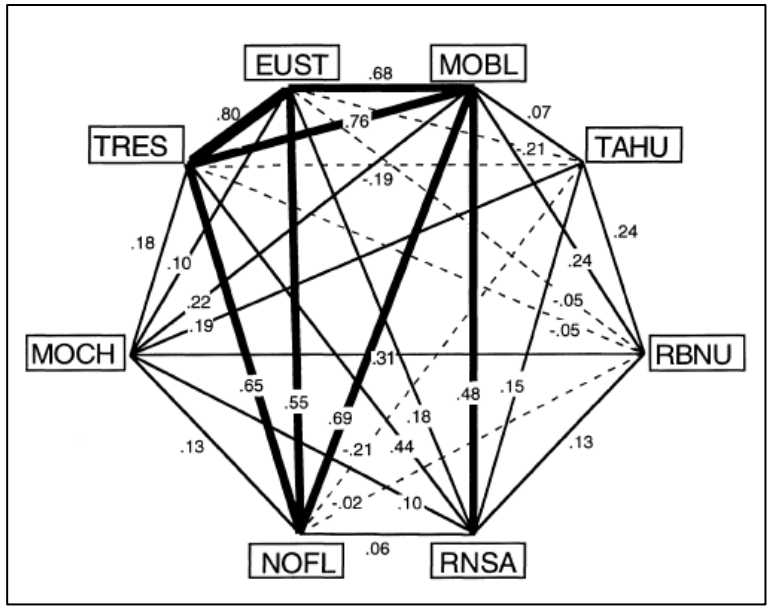
Woodpeckers as Ecological Keystone Species

- Secondary users

Wood Ducks, Fishers

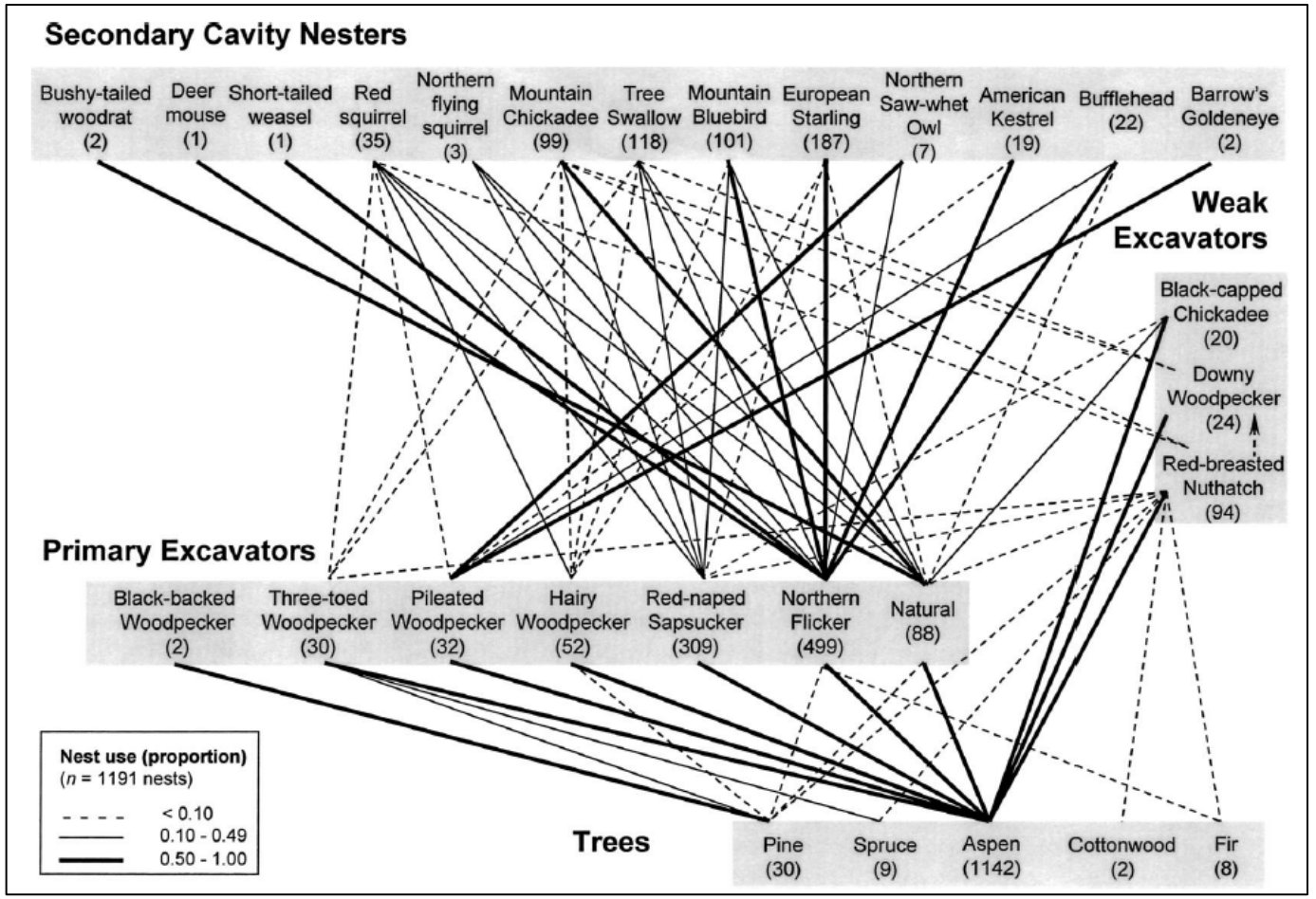
Buffleheads
Hooded Mergansers
Common Goldeneyes
Owls
American Kestrels
Great Crested Flycatchers
Tree Swallows
Purple Martins (historic)
Chickadees
Nuthatches
Bluebirds
Flying Squirrels
Gray Squirrels
Bats
Deer Mice
Pine Martens
Tree Frogs

Nest Webs



Sources:
Martin and Eadie 1999
Martin, Aitken, and Wiebe 2004

- 1142 of 1191 in aspen (96%)
- Aspen = 15% of trees

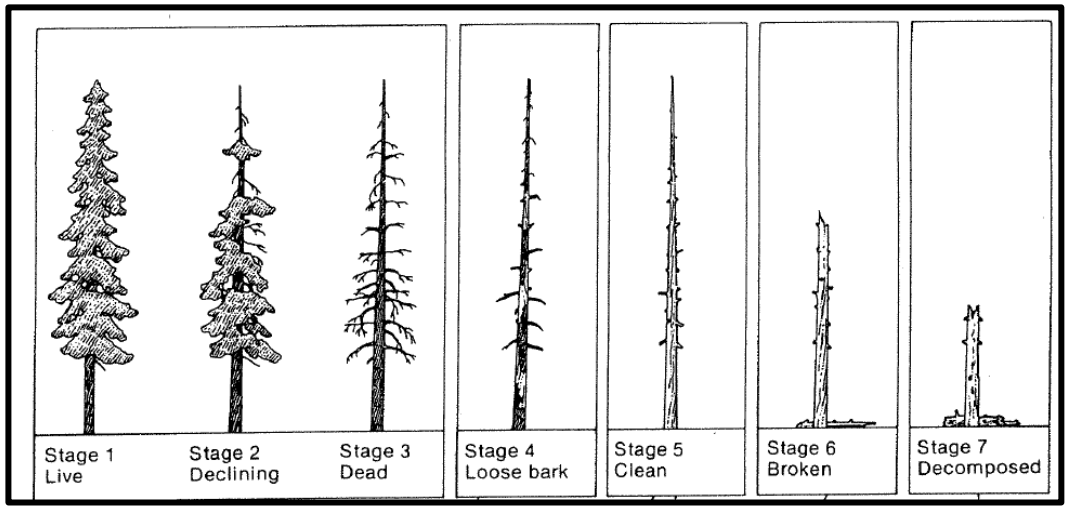


What They Eat

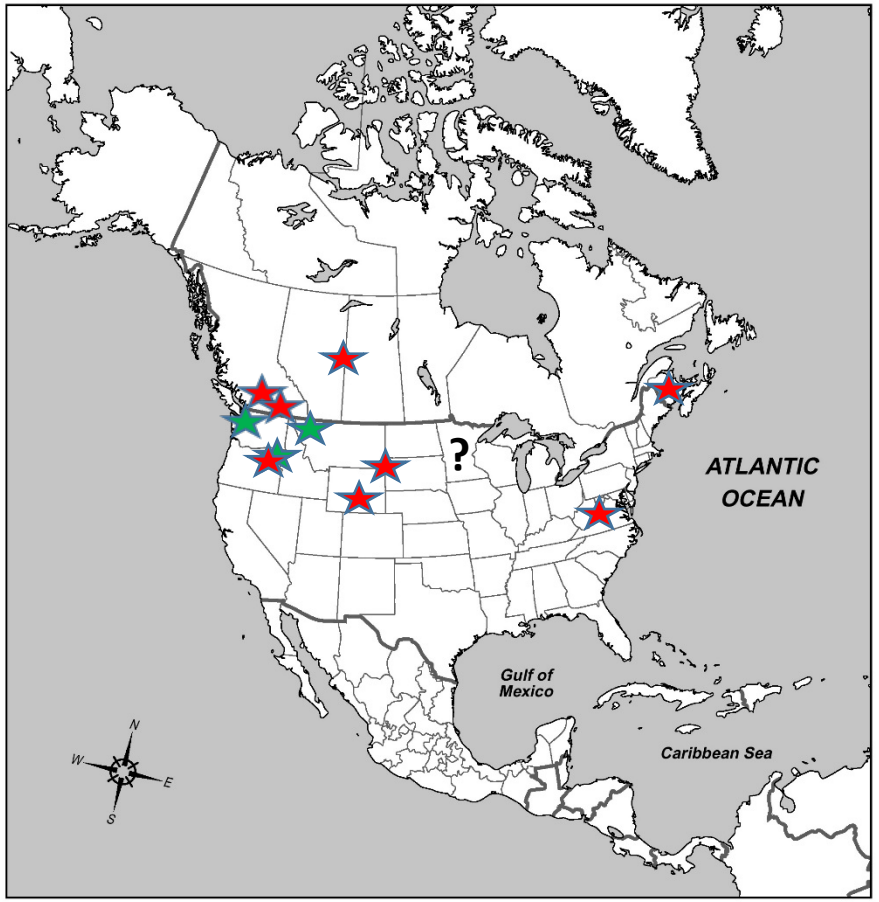
- 98% of spruce bark beetles consumed by woodpeckers (Fayt et al. 2005 in Virkkala 2006)

Basic Information: Breeding

- What are their territory sizes?
- What tree species do they nest in?
  - Alive or dead?
- What size (diameter) are nest trees?
- How old are nest trees?

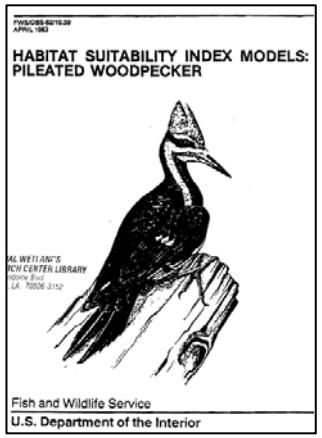


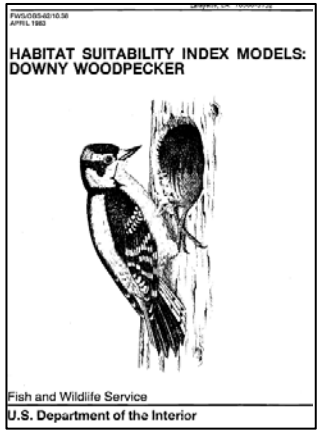
Sources of Basic Information

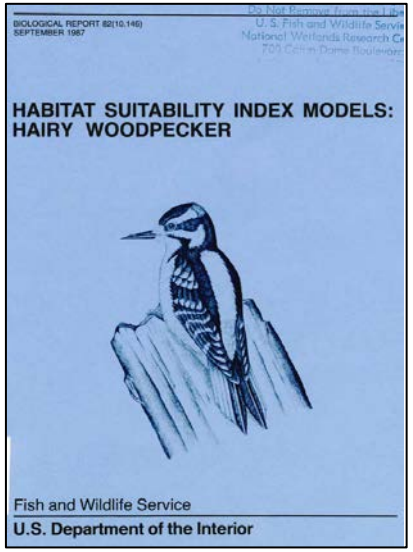


- Conner et al. 1975, Conner 1980
- Thomas 1979 (USFS publ. 553)
- Harestad and Keisker 1989; Martin et al. 2004
- Warren 2004 (Towers et al 1992)
- Anderson 2003 (USFS)
- Loose and Anderson (1995)
- Cooke and Hannon 2012
- Birds of North America
  - Bull 1987
  - McClelland and McClelland 1999
  - Aubry and Raley 2002

Habitat Suitability Index (HSI) Models







Issues:

- Primarily from western, montane settings
- Don’t describe base conditions well
  - Seem to start from a primary, diverse forest
- Don’t consider suitability of future (secondary) forest conditions well

Pileated Woodpecker

- Prefer older, mature trees, living or dead for nesting
- Use wide variety of species, but seem to prefer aspen
- Smallest dbh or diameter at cavity: 25.4, 25.8, 31, 33, 33.4, 38, 65 cm
- Average dbh or diameter at cavity: 40.5, 43, 45, 46, 48, 52, 54, 101 cm
- In Minnesota: avg 45 cm, range 37-56 cm; n=7

- Secondary users: Wood Duck, Hooded Merganser, Common Goldeneye, Northern Saw-whet Owl, Eastern Screech-Owl, American Kestrel, Fisher, Pine Marten

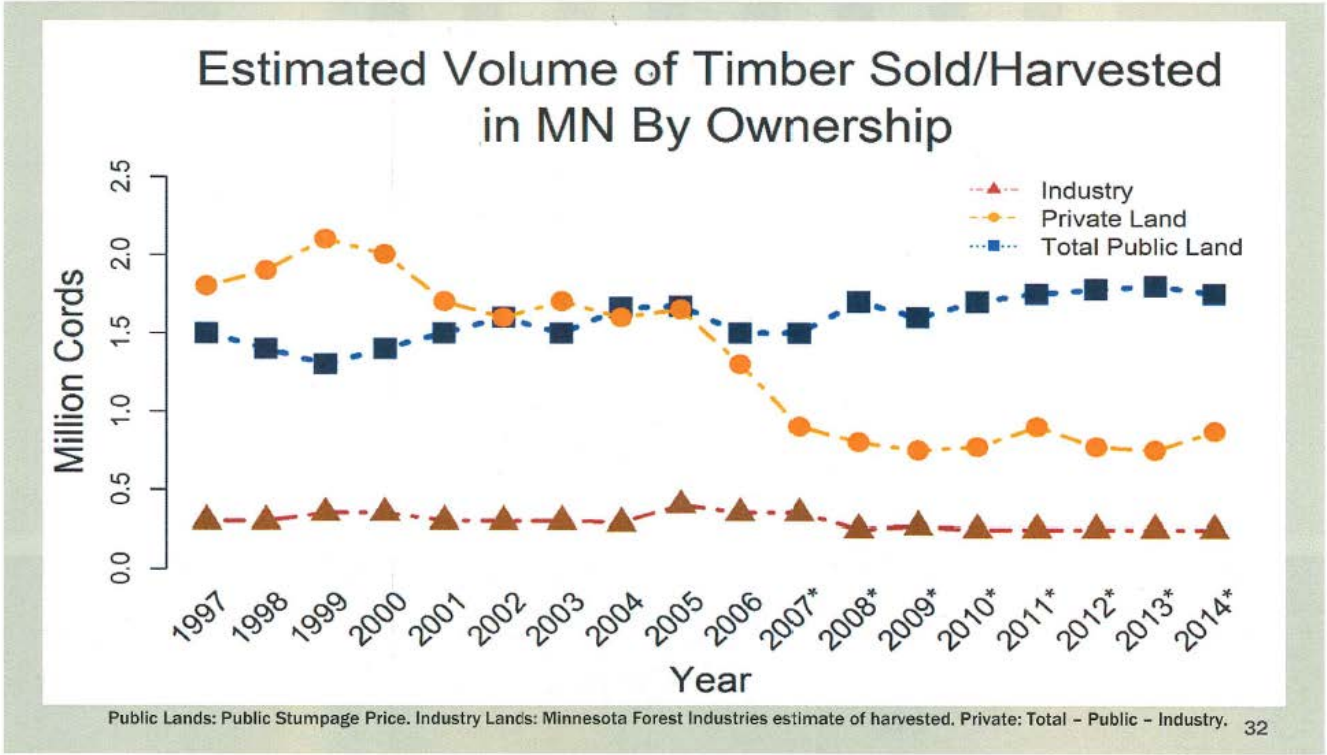
- Basal area of territory: 151 ft^2/acre in Virginia
- Nest often within 150 m of water in Virginia; riparian forest preferred in Oregon

- Used as forest indicator species/for sustainability modelling in British Columbia, Alberta, Manitoba, Ontario, US Pacific Northwest. Used as basis for determining harvest in Great Lakes - St. Lawrence River forests, ON.

Pileated Woodpecker Populations Rising

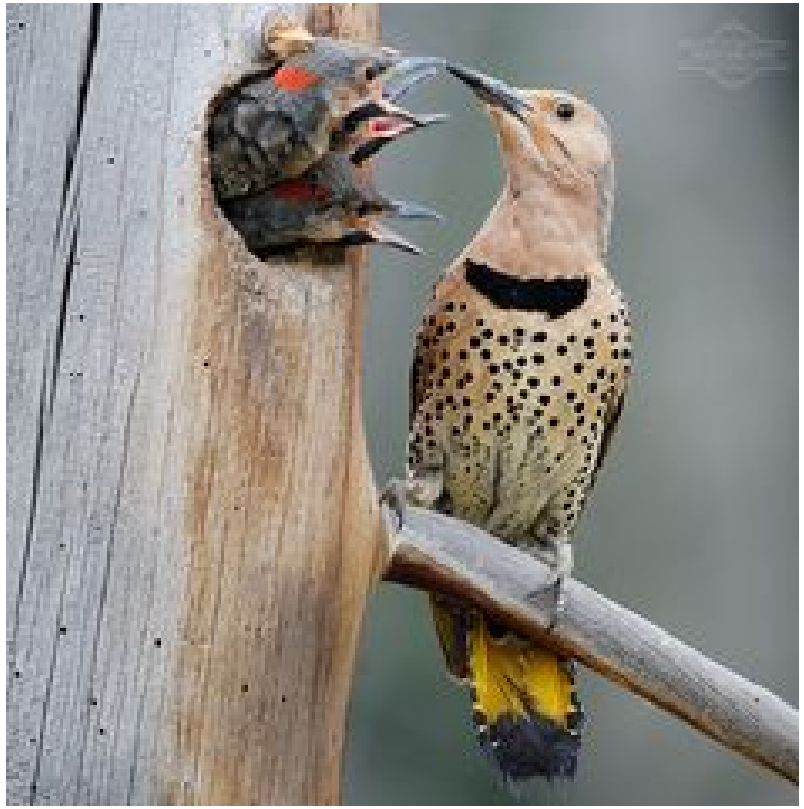
- Minnesota BBS
  - +2.88%/year 1966-2013
  - +1.34%/year 2003-2013

- NRRI (2016; GTR NRS-159)
  - +8.98%/year Chippewa NF
  - +4.57%/year Superior NF
  - for period 1995-2011



Source: Mark Nelson, USFS. *The State of Forest Wildlife Habitat Types in Minnesota*, 10 October 2017.

Northern Flicker



- Prefer dead or dying trees for nesting in cut-over areas
- Use wide variety of species
- Smallest dbh: 15, 20, 21.5, 29, 30 cm
- Average dbh: 32, 33, 35, 37, 43.3, 47 cm
- In Minnesota: prefer dead aspen (73-82%, n=11; also bur oak, basswood); avg dbh 36 cm, range 19-66 cm
- Primary supplier of nests for secondary users: Bufflehead, American Kestrel, Tree Swallow, Eastern Bluebird, Gray Squirrel
- Basal area of territory: 6 ft^2/acre in VA
- Population decline 1.98%/year 2003-2013 in Minnesota (BBS); increasing Chippewa and Superior NF

A.J. Erskine. Buffleheads. 1971

Downy Woodpecker

- Prefer aspen, but also oak, dead or living for nesting
- Smallest dbh: 15, 15, 15, 19, 19, 25 cm
- Average dbh: 22, 25.1, 26.3, 27.6, 32, 37.8 cm
- In Minnesota: prefer aspen (69%, n=13); avg dbh 27.5 cm, range 14.5-51 cm (n=8)
- Secondary users: chickadees, nuthatches
- Basal area of territory: 57 ft^2/acre in Virginia
- Population increase 0.61%/year 2003-2013 in Minnesota (BBS); increasing CNF, decreasing SNF

Hairy Woodpecker

- Prefer living aspen for nesting
- Smallest dbh: 12, 17.4, 20, 22, 23, 25, 25 cm
- Average dbh: 27.6, 30.3, 32.3, 33, 35.6, 41 cm
- In Minnesota: prefer living (90%) aspen (69%, n=16); avg dbh 27 cm, range 22-34 cm (n=4)
- Secondary users: Great Crested Flycatcher, nuthatches, Eastern Bluebird
- Basal area of territory: 94.5 ft^2/acre in Virginia
- Population increase 0.60%/year 2003-2013 in Minnesota (BBS); increasing Chip and Superior

Hairy Woodpecker

Umbrella Species: Downy Woodpecker

- Concept: if you meet the habitat needs for Hairy Woodpeckers, you meet the habitat needs for the smaller Downy Woodpecker

  - Both prefer aspen (69%)
  - Minimum size: 20 cm for HAWO
    15 cm for DOWO
  - Mean dbh: 27-41 cm for HAWO
    22-38 cm for DOWO
  - Basal Area: 94.5 ft^2/acre for HAWO
    57 ft^2/acre for DOWO

Contrasting Species: Northern Flicker

- Concept: if you harvest over-mature aspen, leaving dead snags and leave trees, you convert Hairy Woodpecker habitat to Flicker habitat for $\leq$12 years

  - Prefer aspen (73-82%)
  - Minimum size: 15-19 cm
  - Mean dbh: 33-47 cm
  - Basal Area: 6 ft^2/acre

Yellow-bellied Sapsucker

- Prefer living aspen in mixed deciduous forest for nesting
- Smallest dbh: 16, 20, 21, 21, 21.5 cm
- Average dbh : 25.5, 28, 31, 32.8, 33.6, 37 cm
- In Minnesota: prefer living (78%) aspen (95.5%, n=22); avg dbh 29 cm, range 21-35.5 cm (n=15)
- Secondary users: chickadees, nuthatches; also hummingbirds foraging at sap holes
- Population increase 2.92%/year 2003-2013 in Minnesota (BBS); increasing Chippewa and Superior NF

Black-backed and Three-toed Woodpeckers

Black-backed Woodpecker

- Literature says prefer aspen, lowland conifers, birch for nesting, esp. after fire
- Avg dbh 22.5, 23.5, 31 cm, range 17-40 cm
- In Minnesota, use jack pine (80%) and red pine (20%), living (60%) or dead (40%)
- Avg dbh 25.8, range 19-32.4 cm (n=5); all nests 1.5-2 m up

Three-toed Woodpecker

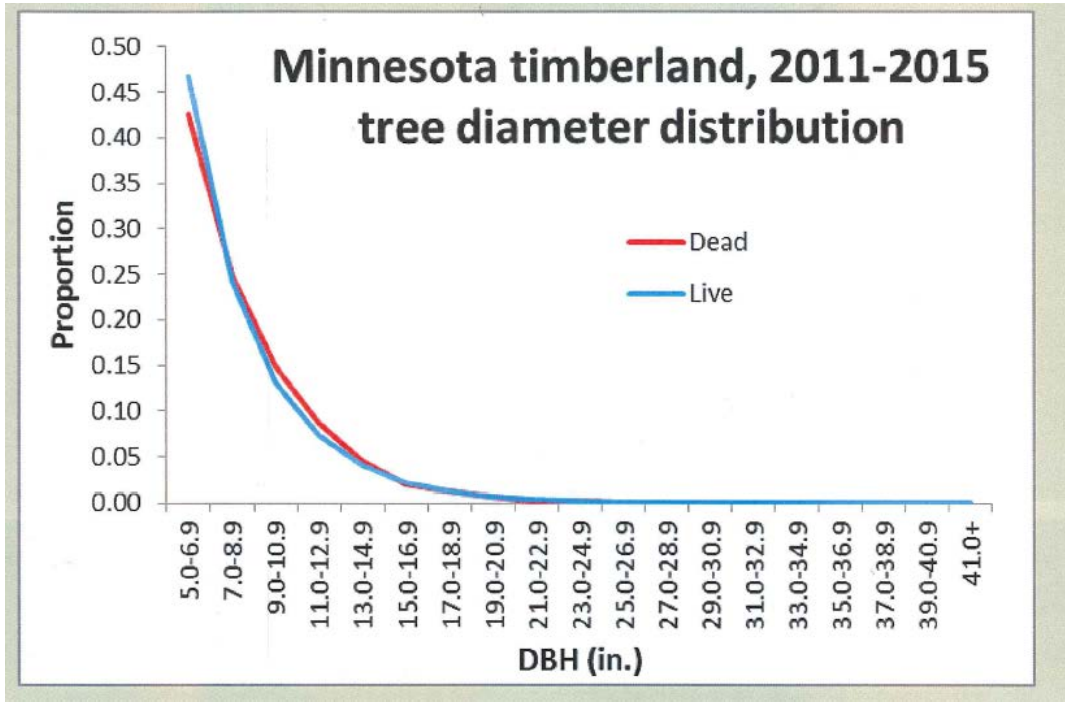
- Literature says prefer aspen, conifers, birch snags for nesting, esp. after fire
- Avg dbh 25.8 (British Columbia) to 27.9 cm (western mountains)
- In Minnesota: no data

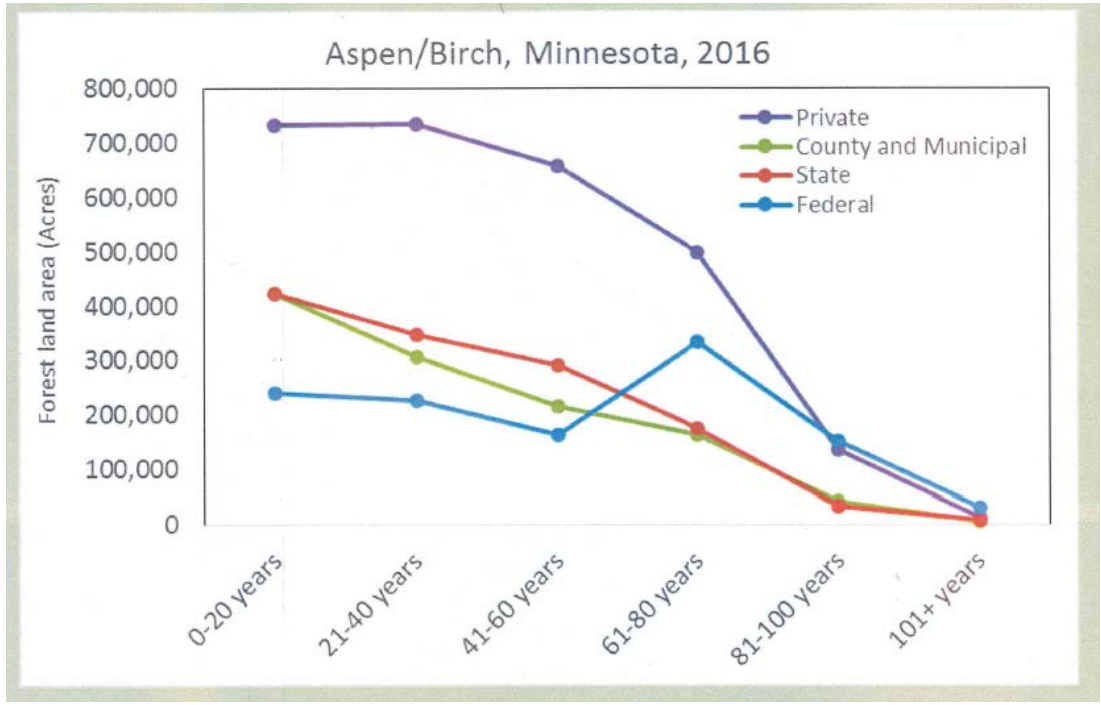
Aspen Ages to Meet Woodpecker Nesting Needs

	Minimum & Average DBH	Age: high site index	Age: low site index
Pileated Woodpecker	Min dbh **25 cm** (10”)	65	>>70
	Avg dbh 46 cm (18”)	>>70	Unattainable?
Hairy Woodpecker	Min dbh 20 cm (8”)	55-60	>70
	Avg dbh 33 cm (13”)	75-80	>>70
Downy Woodpecker	Min dbh 15 cm (6”)	40-50	60
	Avg dbh 27.5 cm (11”)	65	>>70
Yellow-bellied Sapsucker	Min dbh 16 cm (6”)	45-50	65
	Avg dbh 33 cm (13”)	75-80	>>70
Northern Flicker	Min dbh 15 cm (6”)	40-50	60
	Avg dbh 33 cm (13”)	75-80	>>70

From *Manager’s Handbook for Aspen in the North Central States*, USFS GTR NC-36

Resource Availability





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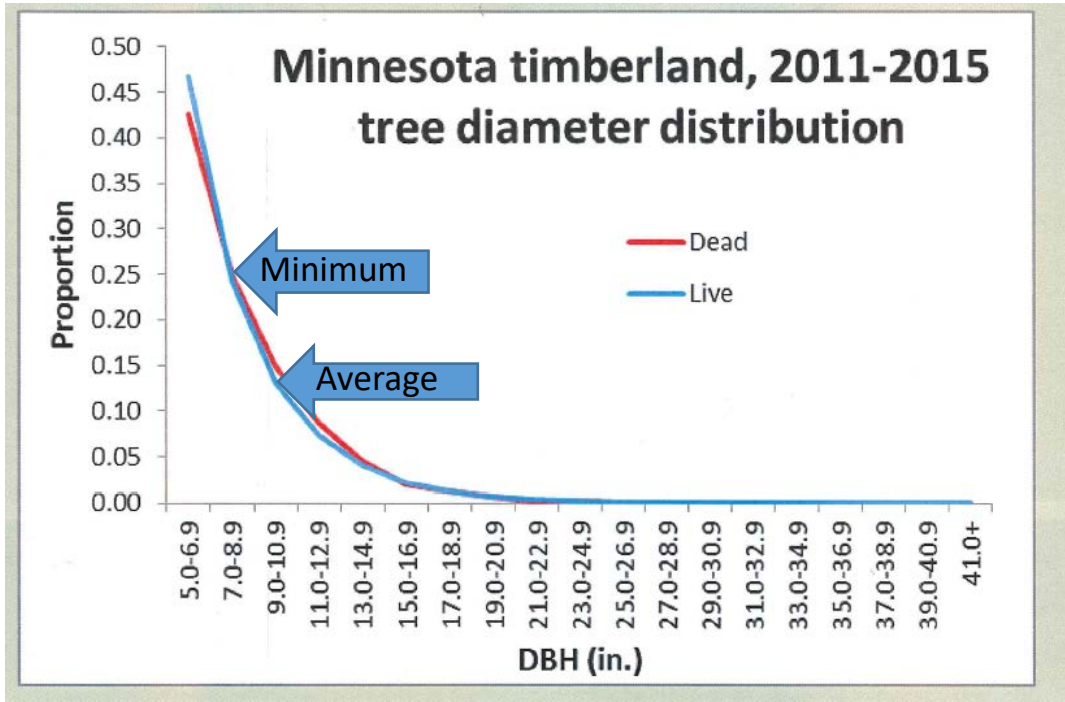
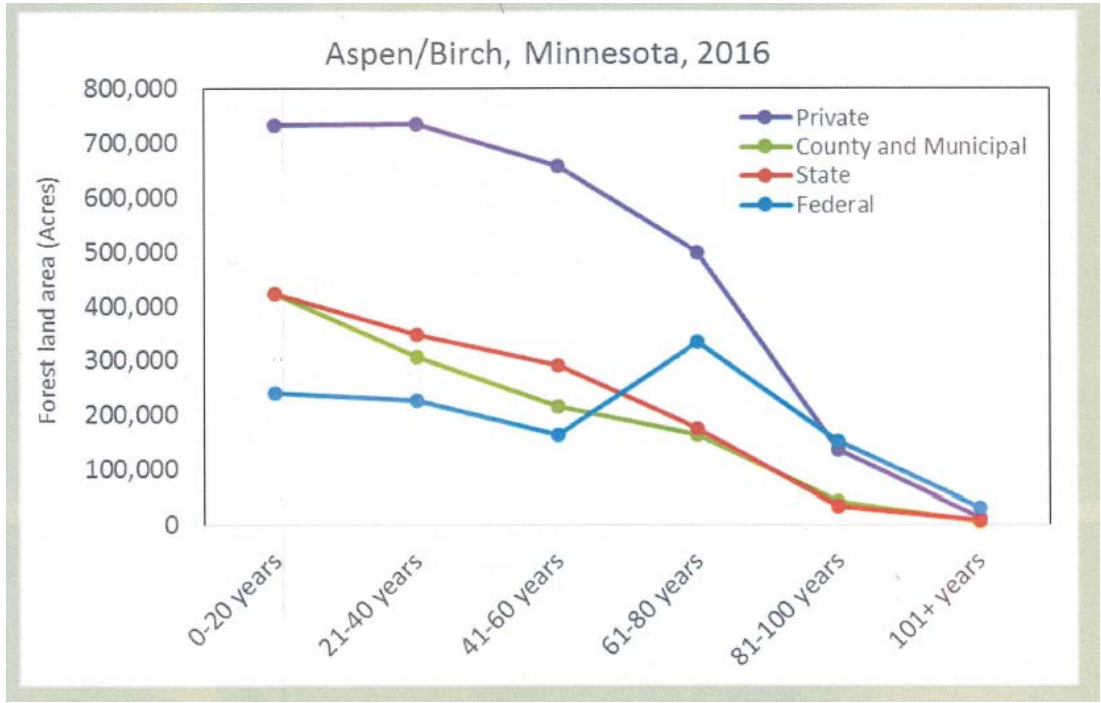




Sources: Mark Nelson, USFS. *The State of Forest Wildlife Habitat Types in Minnesota*, 10 October 2017.

Woodpecker Habitat Suitability Post Timber Harvest (leaving snags and 5% “leave” trees)

Stand Age	Hairy Woodpecker Habitat?	Northern Flicker Habitat?
Preharvest	Yes - maximum	No
1-12 years	Yes - minimal	Yes - maximum
13-20 years	Yes - minimal	Yes - minimal
20-40 years	Yes - minimal	No
40-55 years	No	Yes – maximum through year 52
55-80 years	Yes - minimal	No
80-85 years	Yes	No
86-100 years	No	Yes – maximum through year 98
105 -135 years	Yes	No

Woodpecker Habitat Suitability Post Timber Harvest (leaving snags and 5% “leave” trees): 40-year vs 50-year rotation

Stand Age	Hairy Woodpecker Habitat?	Stand Age	Hairy Woodpecker Habitat?
Preharvest	Yes - maximum	Preharvest	Yes - maximum
1-12 years	Yes - minimal	1-12 years	Yes - minimal
13-20 years	Yes - minimal	13-20 years	Yes - minimal
20-40 years	Yes - minimal	20-50 years	Yes - minimal
40-55 years	No	50-55 years	No
55-80 years	Yes - minimal	55-80 years	Yes - minimal
80-85 years	Yes	80-100 years	Yes
86-100 years	No	100-105 years	No
105 -135 years	Yes	105 -130 years	Yes – minimal (more to 150)

Conclusions: Data Needs

- Lacking a sufficient number of published nest records that correlate tree species, tree size, and tree age for all(?) of the woodpecker species nesting in Minnesota. Issue: narrow seasonal window for easily finding active woodpecker nests.
- Lacking information on territory sizes of woodpecker species in Minnesota.
- Lacking information on the number of pairs a unit of land can support under current forest conditions. For example: Hairy Woodpecker HSI model assumes 80 acres supports 16 pairs. NOT happening here!

ASKING: Finding Nests

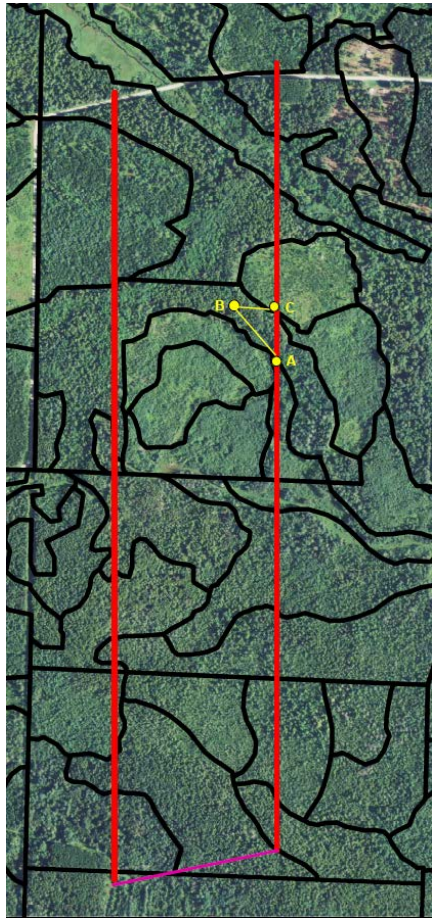
- Find and collect data on woodpecker nests
  - Tree species and condition
  - Tree diameter (inches or cm) (estimated or measured)
  - Tree age (if have access to corer)
  - Location (as specific as possible)
  - And of course the woodpecker species and date
- Email to me at:

michael.north@state.mn.us

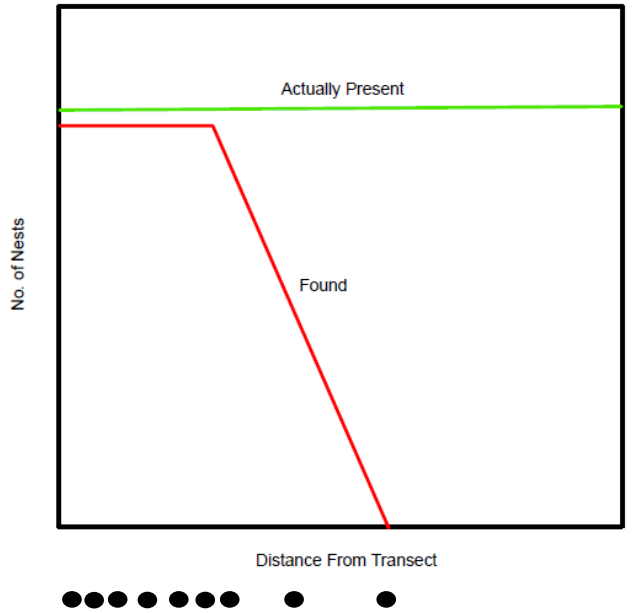
or

tjnorth@brainerd.net

ASKING: Help Running Transects



- I get stand age and cover type from FIM
- You find nests



When to Look/Listen

	Hairy Woodpecker	Downy Woodpecker	Northern Flicker	YB Sapsucker
Nest building	20 April	11-20 April	25 April – 10 May	13 May
Nestling - range	13 May – 6 July	12 May – 10 July	15 May – 6 July	10 June – 17 July
Nestling - peak	**22 May – 13 June**	**3 June – 1 July**	**14-16 June**	**16 June – 6 July**
Fledgling	7 June – 27 July	29 May – 27 July	7 June – 31 July	19 June – 1 August

Based on query of Minnesota Breeding Bird Atlas database and personal data.

You Tube Videos with Sound of Begging Woodpecker Young		
You Tube Title	Time	URL
Baby Hairy Woodpeckers	2:53	https://www.youtube.com/watch?v=chpsNQimupA
Woodpeckers young beg for food	1:28	https://www.youtube.com/watch?v=C_UDXtW1kO0
A young of the great spotted Woodpecker begs for food	1:26	https://www.youtube.com/watch?v=7Ya1N3qDwV0
Baby Woodpecker Squawking for food	0:27	https://www.youtube.com/watch?v=lEI8n7T4DFU
Ungrateful Baby Woodpecker	2:46	https://www.youtube.com/watch?v=EqNkgHiRy9k
Pileated woodpecker feeding her Baby	0:49	https://www.youtube.com/watch?v=bbKR7s0Wymc