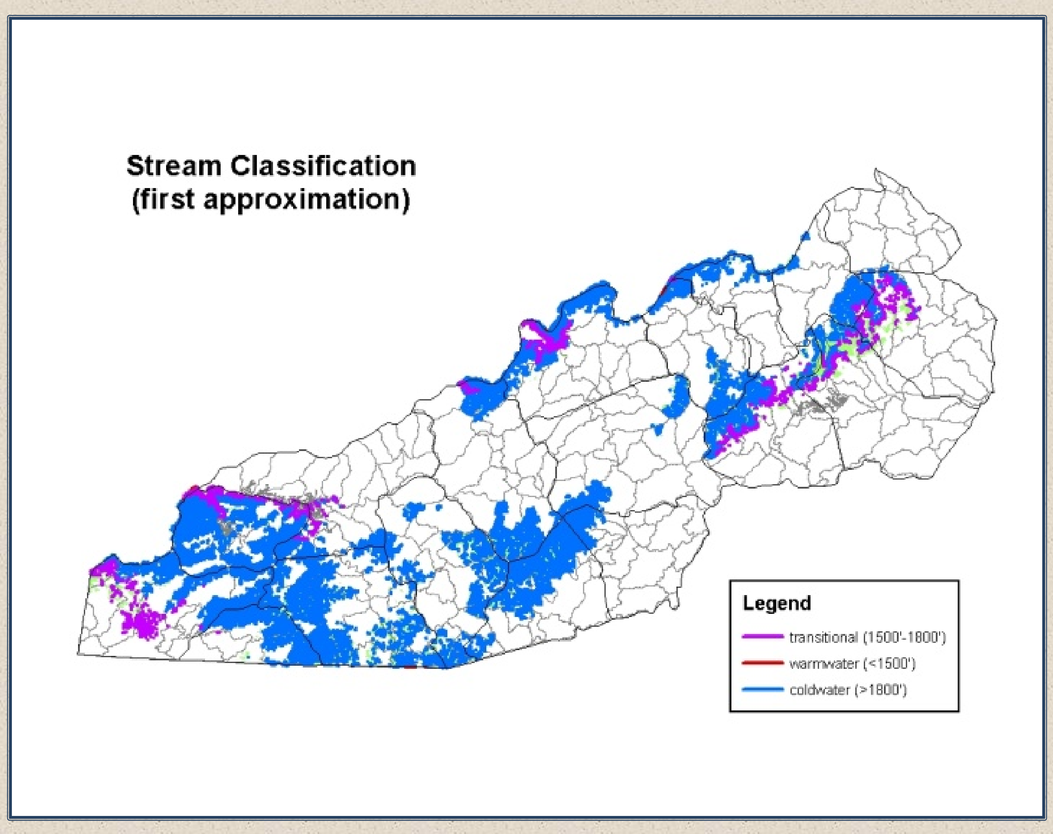
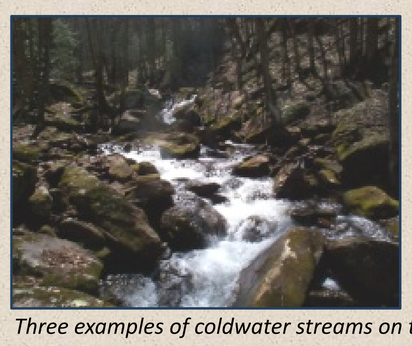
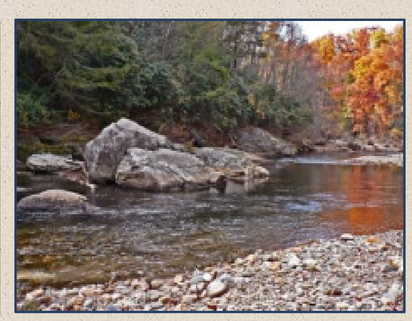
Aquatic Resources

Habitat Classification



- 3,707 miles of streams and rivers
- 3,460 miles (93%) classified as coldwater
- 246 miles (7%) classified as transitional
- 1.5 miles (>1%) classified as warmwater



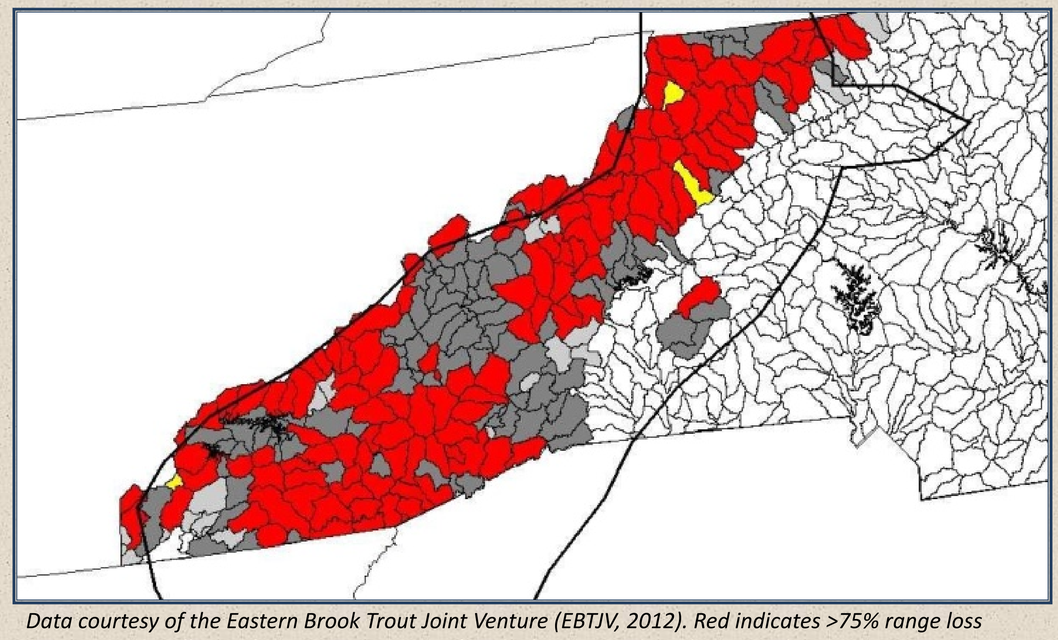


Three examples of coldwater streams on the Nantahala & Pisgah National Forests.
(left to right: Santeetlah Creek headwaters, middle Fires Creek, lower South Toe River)

Focus On Coldwater Streams: Brook Trout

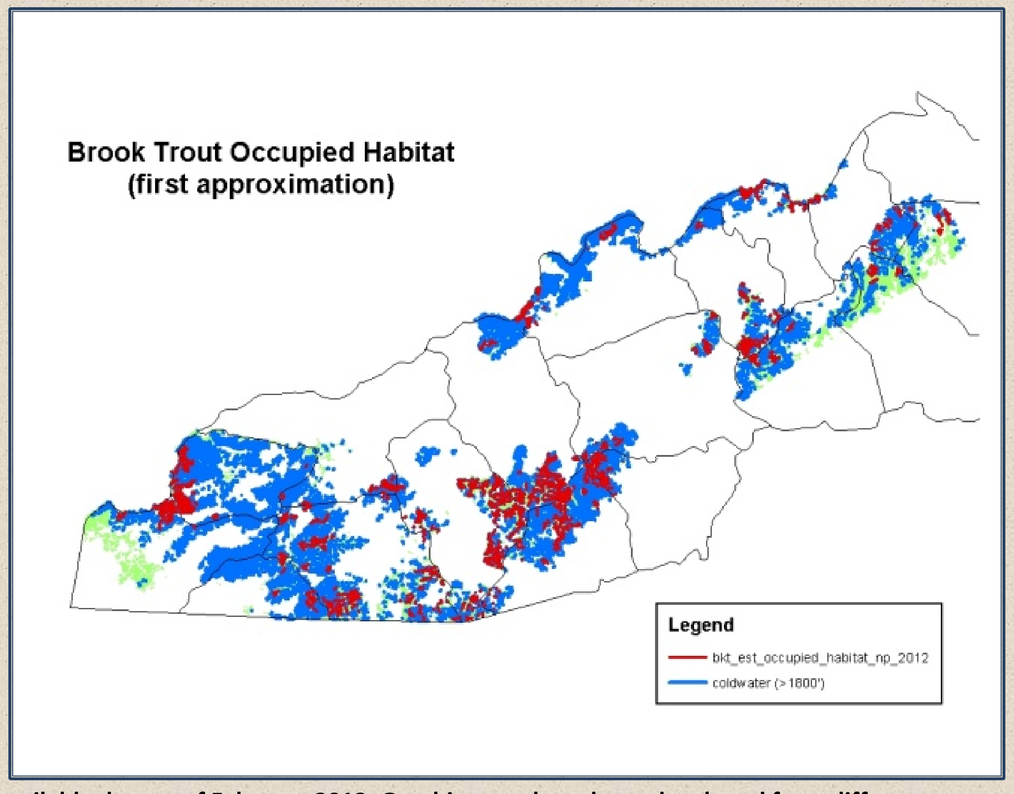
Photo courtesy of Brady Dodd, USFS

Estimated 80% range loss (from historic) leads to a need for protection, enhancement, or restoration.



Data courtesy of the Eastern Brook Trout Joint Venture (EBTJV, 2012). Red indicates >75% range loss (restoration), yellow indicates 50-75% range loss (enhancement), and green indicates <50% range loss (protection).

- **Historically occupied** approximately 3,500 miles of coldwater stream on the Forests (EBTJV)
- **Currently occupy** approximately 750 miles of coldwater stream on the Forests (NCWRC, USFS)



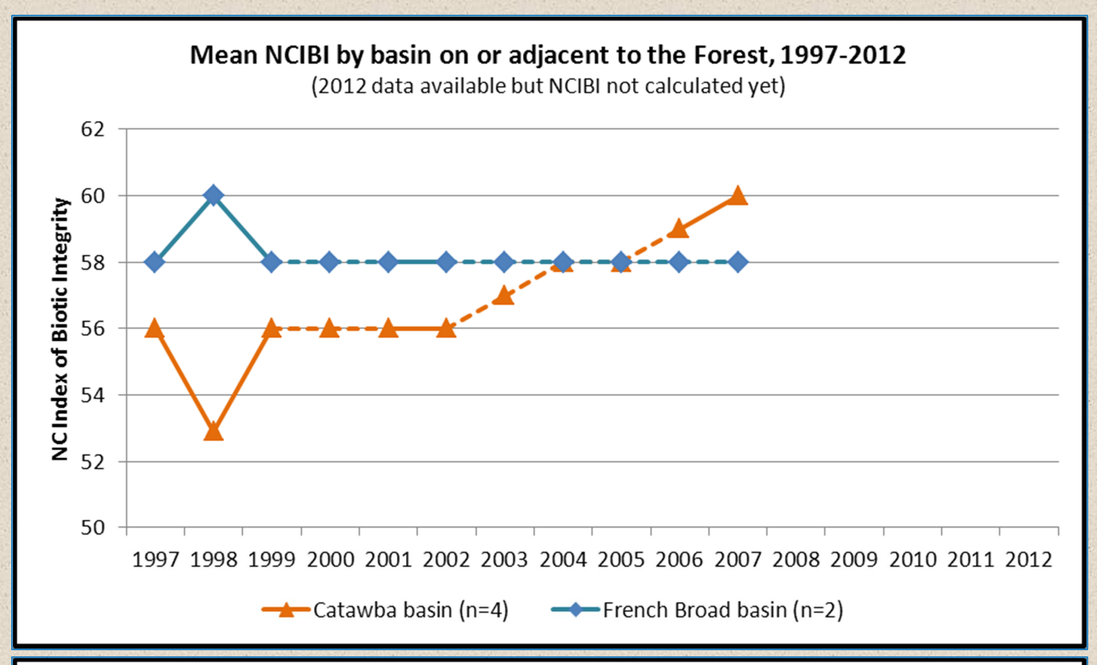
Existing Threats to Brook Trout:

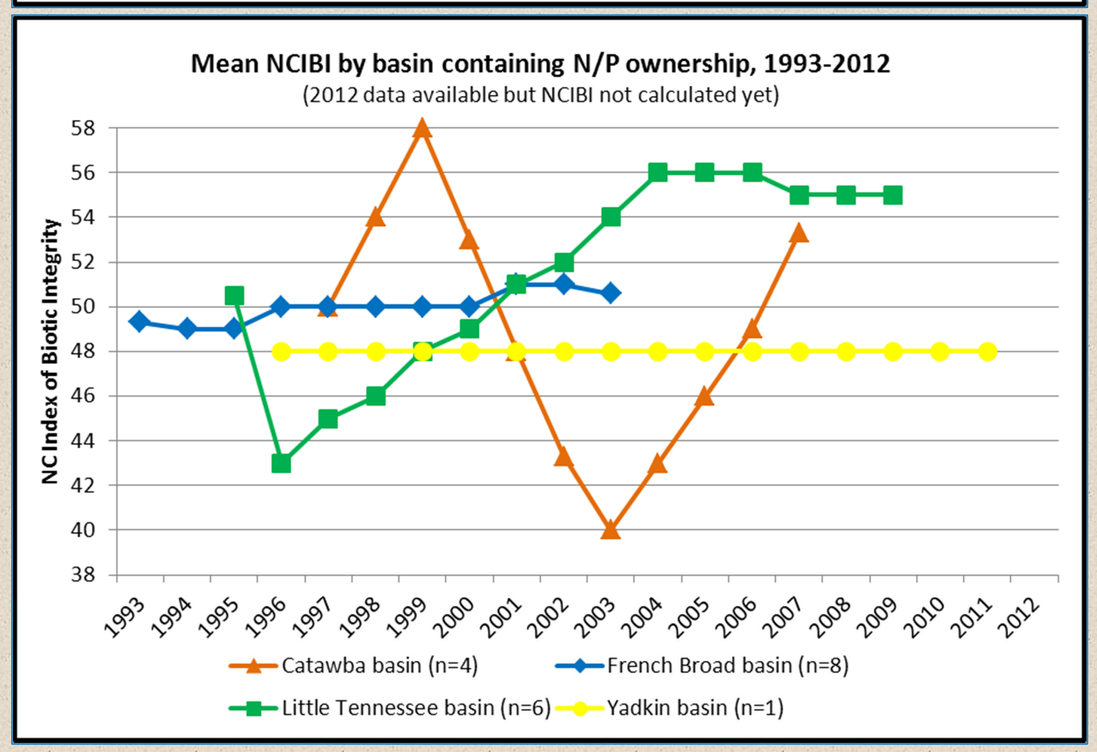
- Exotic species
- Habitat & population fragmentation
- Climate change

DRAFT – best available data as of February 2013. Graphics may have been developed from different sources, accuracies, and modeling, and is subject to change without notice.

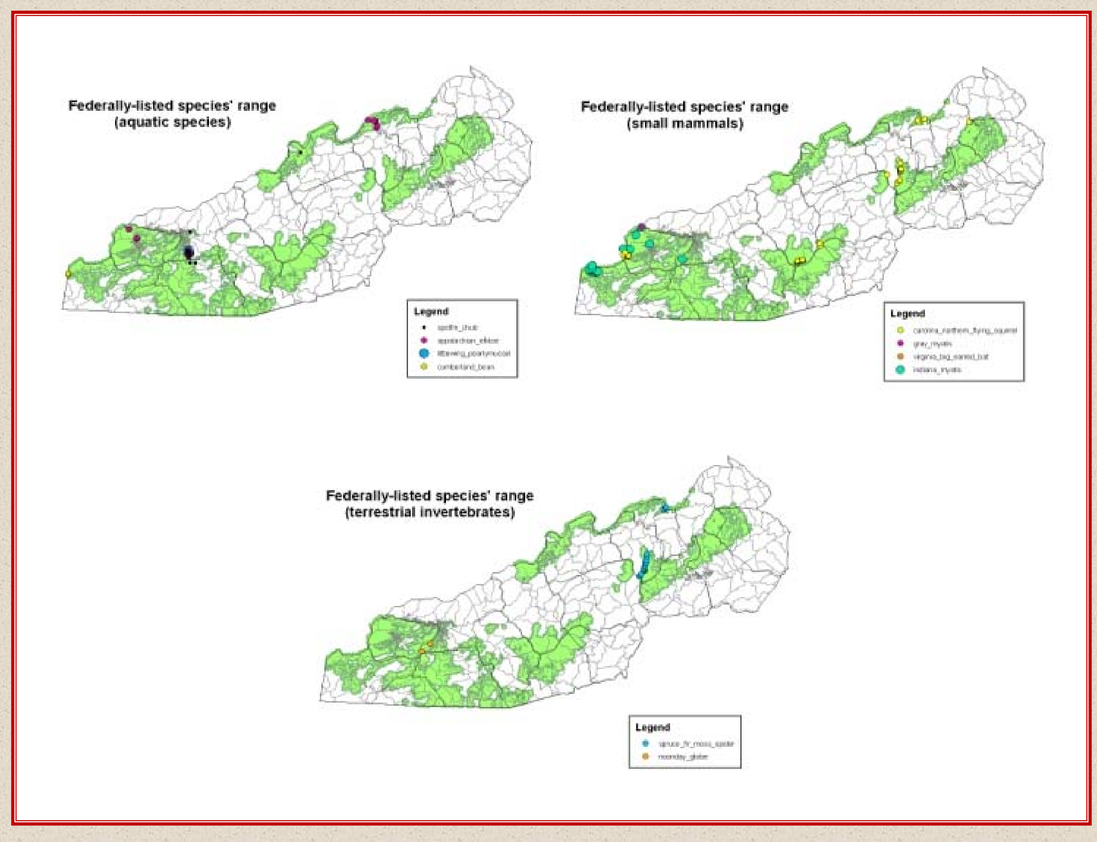
Focus On Transitional Streams: NC Index of Biotic Integrity (NCIBI)

- NCIBI, a measure of fish community health, values provide valuable information
- Individual metrics also have analysis value, such as:
  - **benthic feeders** (sedimentation)
  - **intolerant species** (water quality)
  - **species diversity** (community stability)
- Twelve (12) long-term monitoring sites on the Nantahala and Pisgah National Forests (N&P), 6 with consistent data
- Nineteen (19) sites within watersheds containing N&P lands





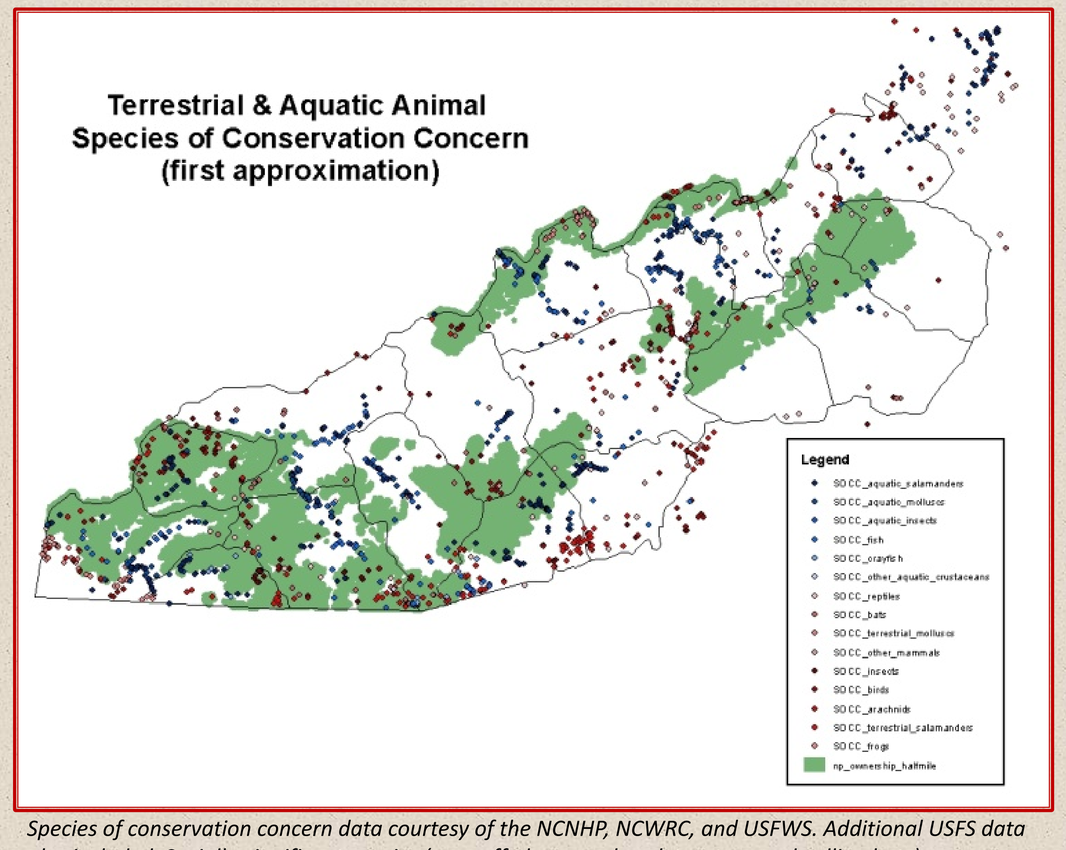
Species of Conservation Concern



Federally-listed species data courtesy of the NCNHP, NCWRC, and USFWS. Additional USFS data also included.

Ten (10) federally-listed or proposed (T, E, or P) wildlife species on or adjacent to the N&P: 3 freshwater mussels, 1 fish, 3 bats, 1 squirrel, and 2 terrestrial invertebrates

1. ***Species rarity*** at local, state, and global scales,
2. ***Social significance***, such as hunting and fishing, and
3. ***Widely-accepted threat***, such as climate change

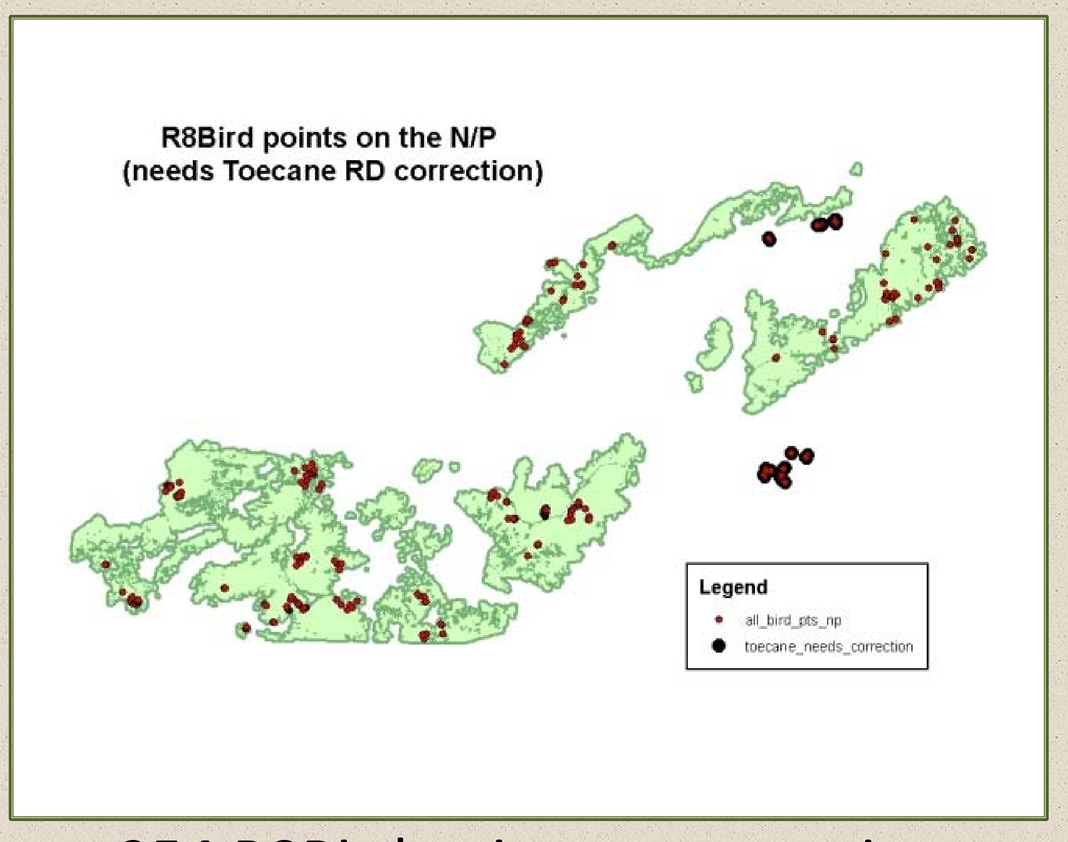


Species of conservation concern data courtesy of the NCNHP, NCWRC, and USFWS. Additional USFS data also included. Socially-significant species (e.g. ruffed grouse, brook trout, cave-dwelling bats) not displayed because distribution would muddle the map.

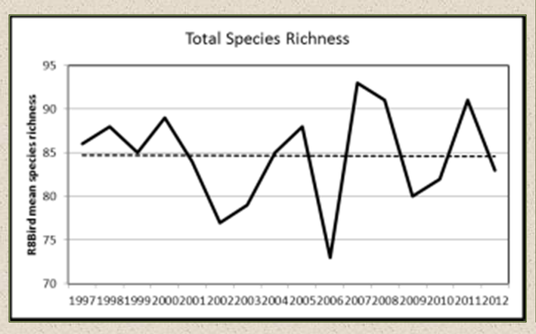
DRAFT – best available data as of February 2013. Graphics may have been developed from different sources, accuracies, and modeling, and is subject to change without notice.

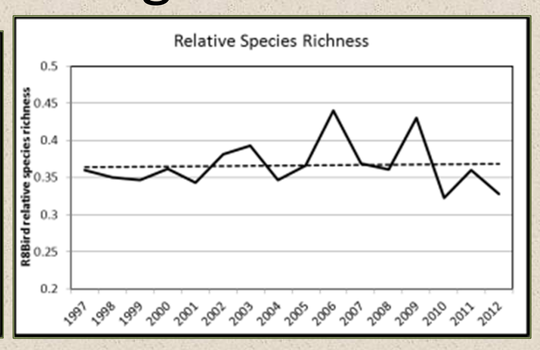
Terrestrial Wildlife

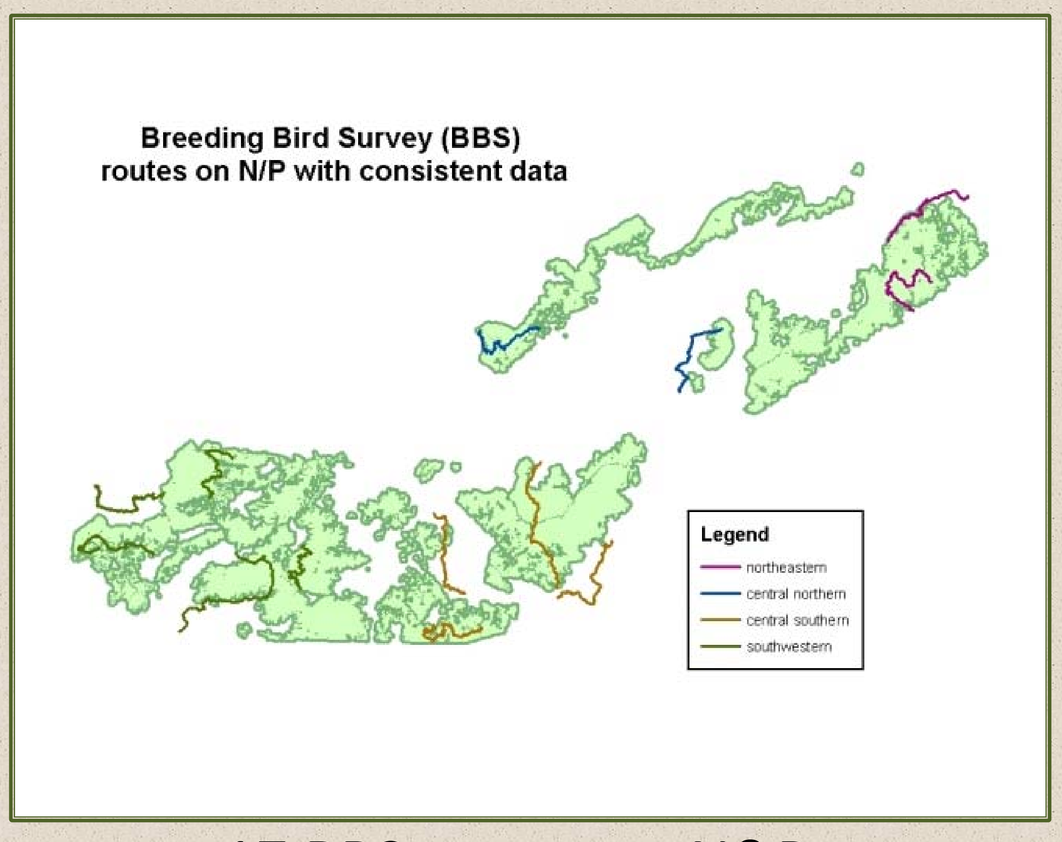
Land Birds



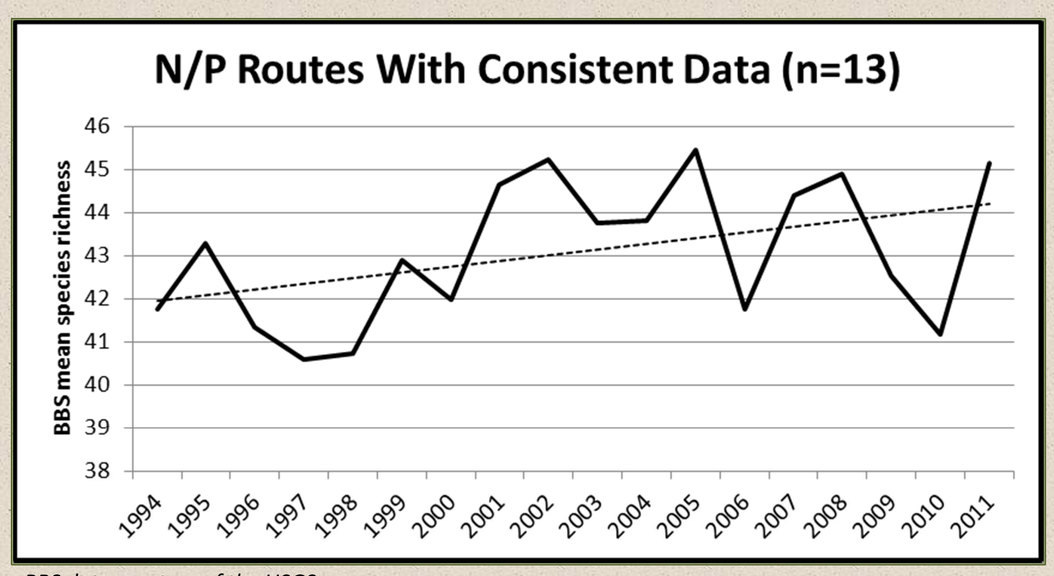
254 R8Bird points representing "traditional" management







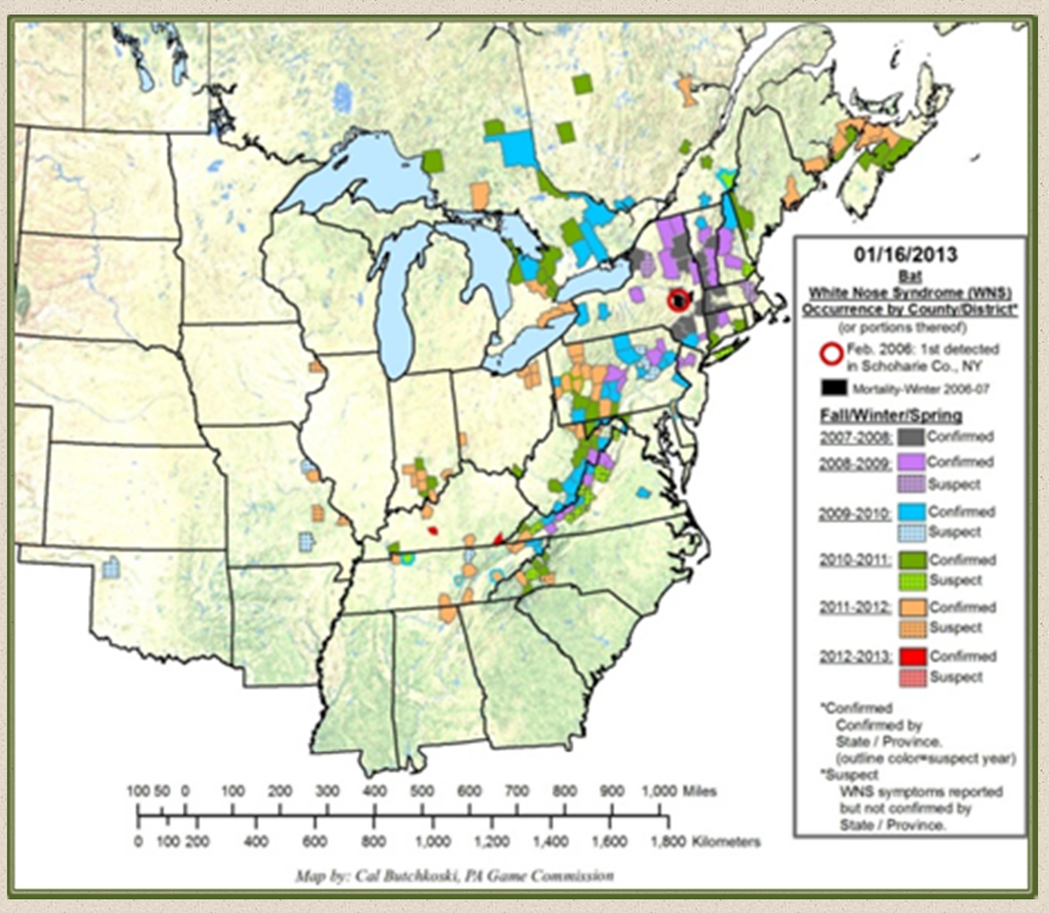
17 BBS routes on N&P;
13 with consistent data



BBS data courtesy of the USGS

Bats

Scientific Name	Common Name	Federally-listed	Generally Rare	Susceptible to WNS
Corynorhinus rafinesquii	Rafinesque's big-eared bat		Yes	
C.townsendii virgineanus	Virginia big-eared bat	Yes		
Eptesicus fuscus	big brown bat			Yes
Lasionycteris notivagans	silver-haired bat			
Lasiurus borealis	eastern red bat			
Lasiurus cinereus	hoary bat			
Lasiurus seminolus	Seminole bat			
Myotis grisescens	gray bat	Yes		Yes
Myotis leibii	eastern small-footed bat		Yes	Yes
Myotis lucifugus	little brown bat			Yes
Myotis septentrionalis	northern myotis			Yes
Myotis sodalis	Indiana bat	Yes		Yes
Perimyotis subflavus	tri-colored bat			Yes



Photos courtesy of the Southeastern Bat Diversity Network

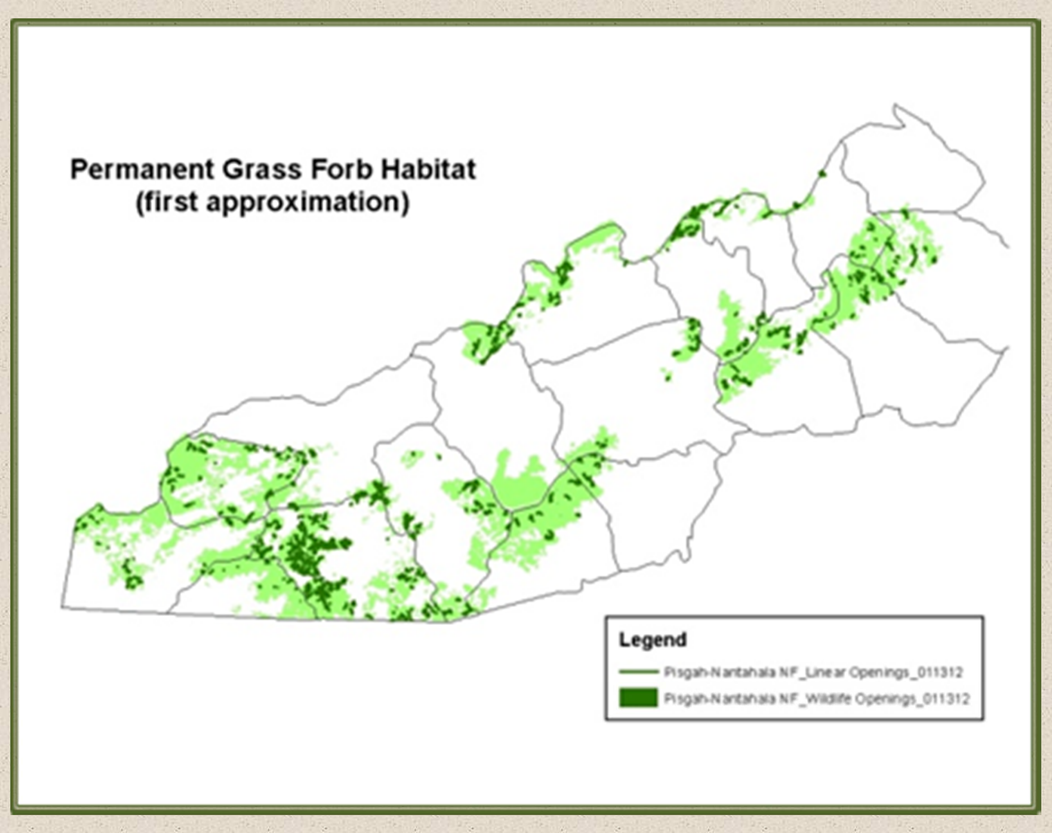
Other Species Groups To Be Addressed

- Amphibians (salamanders)
- Rare species (see SOCC)
- Game species (see social demand)
- "new" species on the N&P (e.g. elk)

DRAFT – best available data as of February 2013. Graphics may have been developed from different sources, accuracies, and modeling, and is subject to change without notice.

Special Habitats

Young Forests



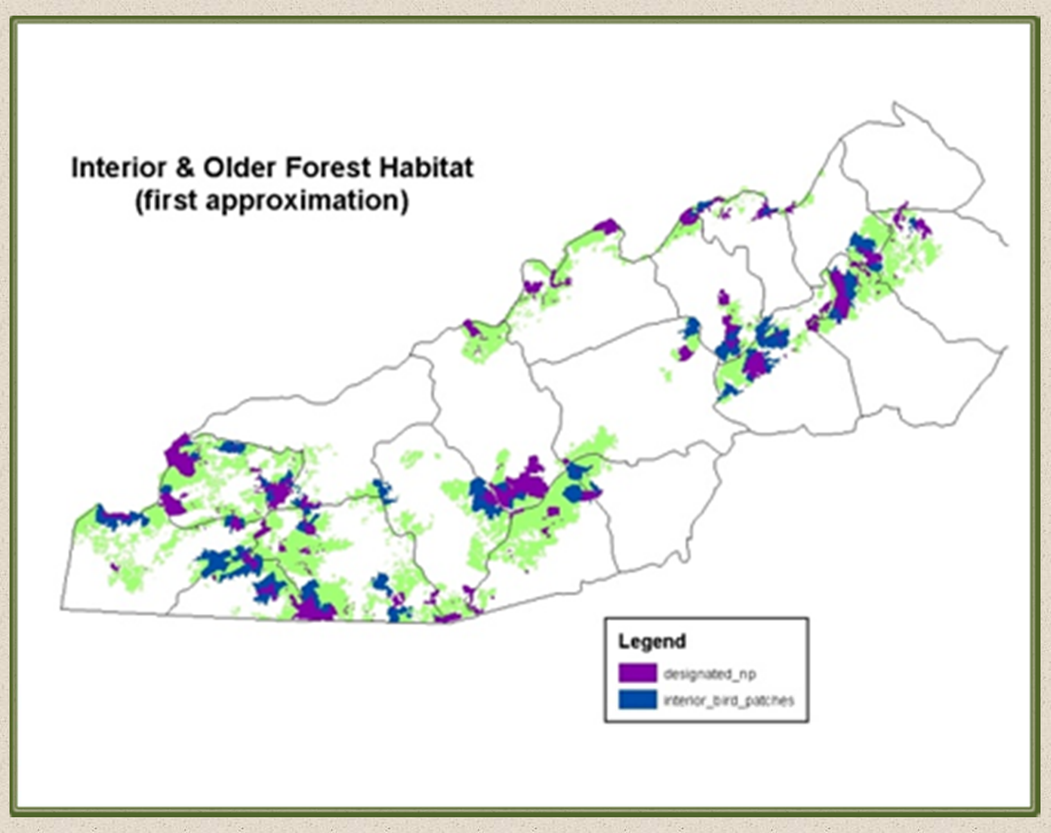
County	Acres	FS acres	Opening acres	Linear acres	% cty perm G/F	% FS perm G/F
Avery	157,171	28,369	86.89	26.37	0.07%	0.40%
Buncombe	422,043	31,464	18.89	43.25	0.01%	0.20%
Burke	329,406	48,794	67.04	49.67	0.04%	0.24%
Caldwell	303,422	49,416	52.36	49.42	0.03%	0.21%
Cherokee	298,544	93,422	81.95	42.23	0.04%	0.13%
Clay	141,099	65,934	37.71	10.82	0.03%	0.07%
Graham	192,970	113,443	140.15	95.76	0.12%	0.21%
Haywood	354,812	68,886	53.24	60.78	0.03%	0.17%
Henderson	239,980	17,295	48.08	22.24	0.03%	0.41%
Jackson	316,350	77,220	79.99	137.22	0.07%	0.28%
Macon	332,334	153,199	264.02	501.81	0.23%	0.50%
Madison	288,892	55,278	182.84	68.43	0.09%	0.45%
McDowell	285,540	73,728	64.01	79.84	0.05%	0.20%
Mitchell	142,114	18,916	22.93	51.10	0.05%	0.39%
Swain	345,863	22,352	27.23	94.70	0.04%	0.55%
Transylvania	243,440	88,307	95.47	48.79	0.06%	0.16%
Watauga	199,810	393	0.00	7.01	0.00%	1.78%
Yancey	200,309	38,272	115.94	74.03	0.09%	0.50%
TOTAL	**4,794,099**	**1,044,688**	**1,438.73**	**1,463.48**	**0.06%**	**0.28%**

Ranger District	FS acres	Opening acres	Linear acres	% FS perm G/F	Avg opening acres	Avg linear acres
Appalachian	161,511	478.17	289.19	0.48%	1.93	1.56
Cheoah	120,110	146.94	98.37	0.20%	0.84	1.12
Grandfather	192,540	230.90	180.31	0.21%	1.62	2.28
Nantahala	259,110	349.13	632.14	0.38%	1.11	2.01
Pisgah	160,000	167.52	69.49	0.15%	1.90	2.57
Tusquitee	152,348	130.74	53.35	0.12%	0.74	0.60
TOTAL	**1,045,619**	**1,503.39**	**1,322.85**	**0.27%**	**1.30**	**1.68**

- Maintained in grassy or brushy phase of early succession
- Transition to forested habitats
- Native and warm season grasses
- Vector for invasive plant species
- Ephemeral young forests achieved through vegetation management

Golden-winged warbler (Vermivora chrysoptera)
Photo credit: Mike Cong, GWWA Working Group

Old Forests



- Approximately 205,100 acres designated as old growth
- Approximately 94,720 acres managed for interior forest conditions

Cerulean warbler (Setophaga cerulea).
Photo courtesy of forestryimages.org.

Other Special Habitats

- ***High places***: spruce-fir and other high elevation forests
- ***Rocky places***: outcrops and boulderfields
- **Wet places**: bogs, seeps, and riparian areas
- ***Dark places***: caves and abandoned mines

DRAFT – best available data as of February 2013. Graphics may have been developed from different sources, accuracies, and modeling, and is subject to change without notice.