

GTNP BREEDING BIRD MONITORING PROJECT

2001 SEASON



M. L. CODY ✦ DEPARTMENT OF BIOLOGY
UNIVERSITY OF CALIFORNIA ✦ LOS ANGELES

✦ OVERVIEW: GTNP BREEDING BIRD MONITORING PROJECT:

1. Following initial independent work by M. L. Cody and by funding from NPS, we instigated a scheme for long-term monitoring of breeding land bird populations in a wide variety of habitats representative of the northern Rockies and the Greater Yellowstone Ecosystem (GYE). Census sites are located almost entirely within Grand Teton National Park, where a broad range of representative vegetation types is accessible within close geographic proximity.
2. 30 monitoring sites are established within and adjacent to the park in pristine habitat. Sites range from the Jackson Hole lowlands to subalpine and alpine sites, from meadow, sagebrush and marshland, through willow scrub, cottonwood and aspen woodlands, to lodgepole pine and spruce-fir forests. Some sites have a monitoring history of >30y; others were established in the mid-1990's.
3. The location and accessibility of the study sites permits all to be regularly and repeatedly censused during the short (6-week) breeding season. Census sites are standardized in area (5-10 ha in size) and mapped in detail (topographic features, vegetation). Census schedules, timing, and methodological protocols are established, and allow for controlled inter-site and inter-year comparisons in breeding bird populations, species composition, and densities.

✦ 2001 SEASON: COVERAGE AND PARTICIPANTS

Participants. Four persons participated in the 2001 census effort, as listed below:

Anna Chalfoun
Resource Management
GTNP, Moose, WY

Martin L. Cody
Dept. Organismic Biology, Ecology & Evolution
University of California
Los Angeles, CA 90095-1606
PH: 310-825-1327; FX: 310-206-3987; EM:
mlcody@ucla.edu

Matt Killebrew
P.O. Box 284
Moose, WY 83012
PH: 307/734/0652; EM: Matt_Killebrew@nps.gov

Sue Wolff
PO Box 91
Moose, WY 83102
307-739-3464; EM: susan_wolff@nps.gov

Site Coverage

Eighteen of the 30 monitoring sites were assessed in 2001. Coverage was continued on those sites with the longest monitoring history, which in some cases covers several decades; coverage also spanned the full habitat range of GTNP's monitoring sites (see Table 1).

The last column of the table indicates the sites censused the 2001 season; the selection continues an unbroken continuity at important "flagship" sites and also extends coverage of some less routinely censused areas. Overall, most of the 30 sites have been censused over about a decade.

The Y2001 Censuses

The list of breeding species seen at the monitoring sites (Appendix A) now stands at 152. Y2001 was a dry year; a review of the climate data from the Moran weather station is summarized as follows. Over the last 50 y, precipitation AUG-JUL (basically the 12 months preceding a breeding census survey) averaged 606 mm. Precipitation 2000-01 was well below average (466 mm), while the annual mean temperature was very close to the long-term mean.

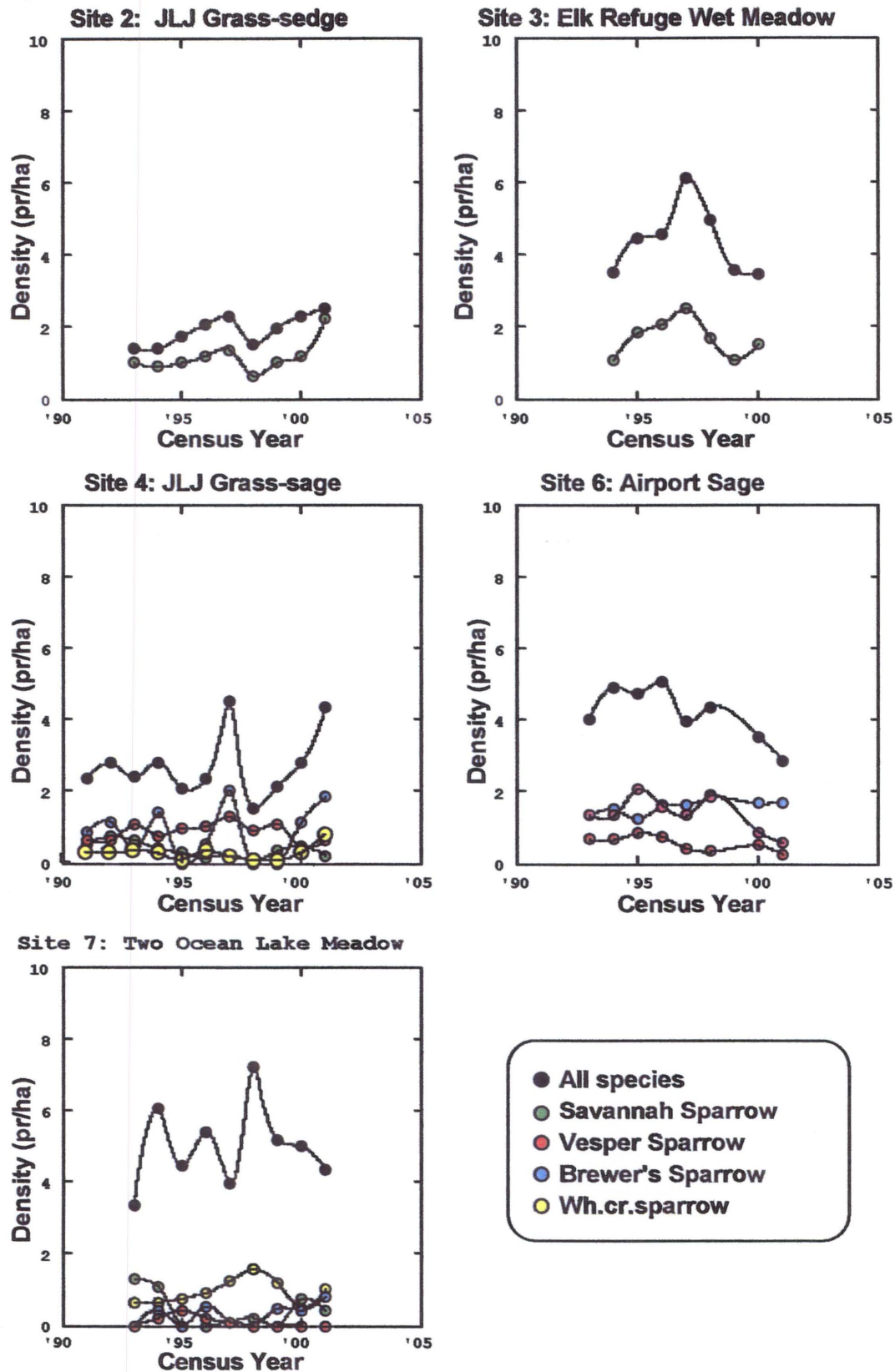
Breeding densities of representative common species are summarized in Figure 1 Site 2-25. In this figure, sites grouped into "meadow", "willow-aspen-cottonwood" and "pine-spruce-fir" categories respectively depict the densities of representative species plotted as functions of time. In Figure 2, the breeding sparrows in sites near Jackson Lake Junction are shown in the same axes.

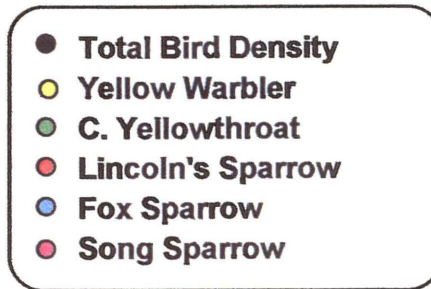
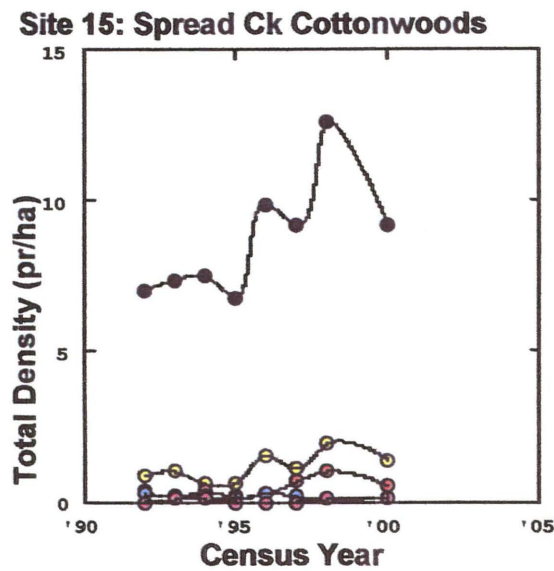
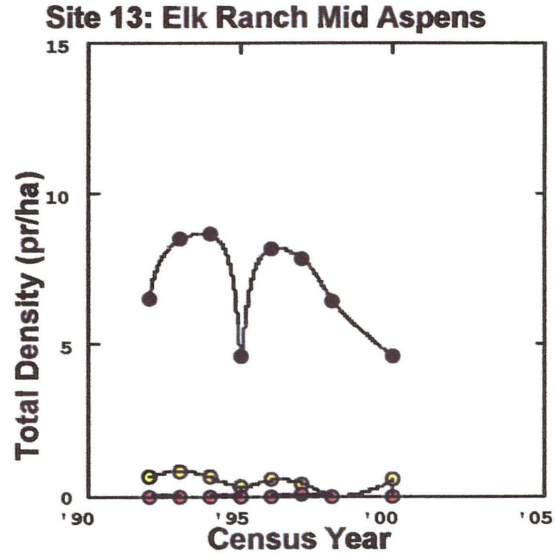
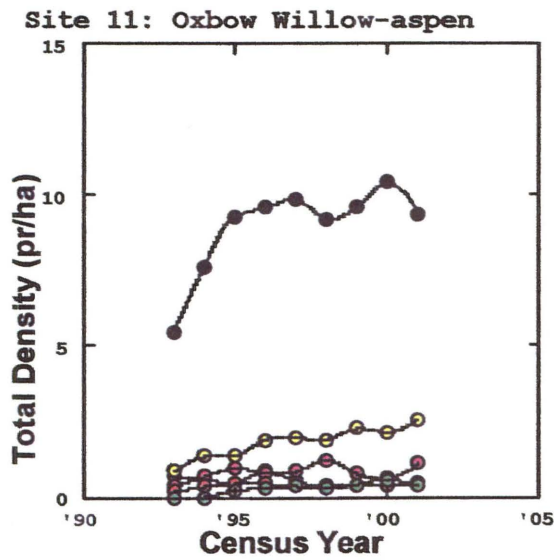
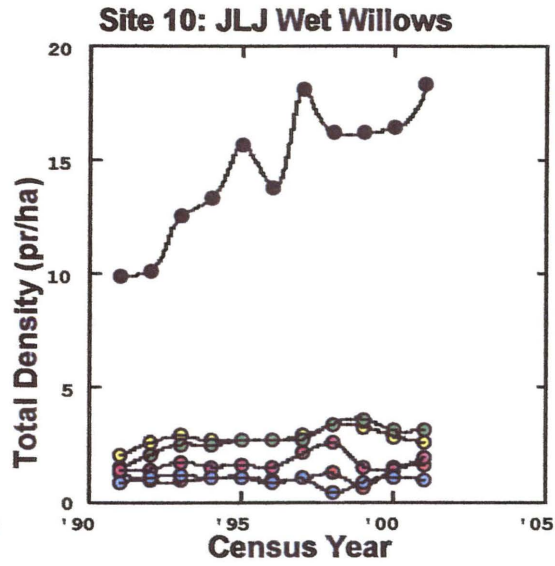
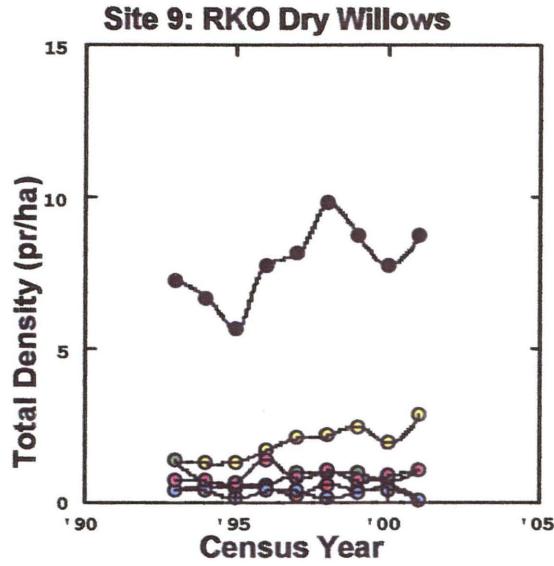
Monitoring data are now sufficiently extensive so that further analyses are possible. The coefficient of variation (CV) is reasonably evaluated over a ten-year stretch, and the relation between breeding density CV and migration strategy addressed. Figure 3 (from Cody, 2002) shows that, contrary perhaps to the most obvious hypothesis that long-distance migrants will be more variable in breeding density year-to-year, the opposite is the case, with least variation seen in species wintering further from GTNP. The relation, while not statistically significant, is nevertheless suggestive and interesting.

Table 1. Cody, M. L. 2002. Seasonal bird traffic between Jackson Hole, Wyoming, and western Mexico. Proc. Partners in Flight Asilomar Conference, USFS Gen. Tech. Rep. (in press).

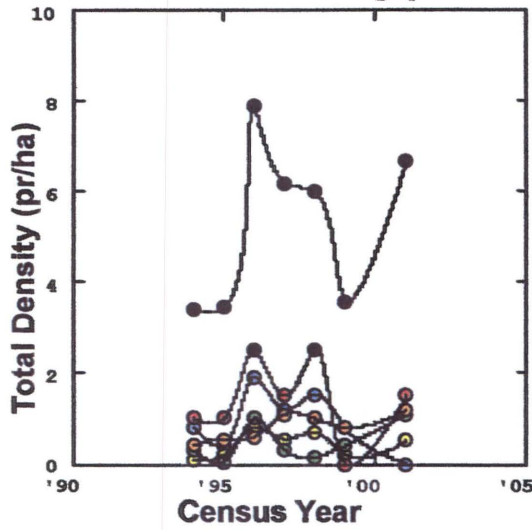
COVERAGE OF GTNP BREEDING BIRD MONITORING SITES, 1966-2001													
Site/Censused	66	91	92	93	94	95	96	97	98	99	0	1	Total Yrs
1:Wolf Rch			1	1	1	1	1	1				1	7
2:JLJ Sedge			1	1	1	1	1	1	1	1	1	1	10
3:Elk Refuge					1	1	1	1	1	1	1		7
4:JLJ Gr-sage	1	1	1	1	1	1	1	1	1	1	1	1	12
5: Ant.Flats						1	1	1		1	1		5
6: Airpt Sage				1	1	1	1	1	1		1	1	8
7: 2OL Meadow				1	1	1	1	1	1	1	1	1	9
8:Triangle X							1	1				1	3
9: RKO				1	1	1	1	1	1	1	1	1	9
10:JLJ Will	1	1	1	1	1	1	1	1	1	1	1	1	12
11: Oxbow				1	1	1	1	1	1	1	1	1	9
12: Elk Rch W	1		1	1	1	1	1	1					7
13: Elk Rch E	1		1	1	1	1	1	1	1		1		9
14: Cow Lk	1		1	1	1	1	1	1		1		1	9
15: Spread Ck			1	1	1	1	1	1	1		1		8
16: Schwabch			1	1	1	1	1	1		1		1	8
17: L. Granite						1	1	1			1		4
18: Timbered Is					1	1	1	1	1	1		1	7
19: AMK			1	1	1	1	1	1	1	1	1	1	10
20: TaggartLk					1	1	1	1	1			1	6
21: Signal Mt			1	1	1	1	1	1	1	1	1		9
22: Spaulding						1	1	1				1	4
23: LizardCk			1	1	1	1	1	1				1	7
24: Bradley					1	1	1	1				1	5
25:JennyLk				1	1	1	1	1	1	1	1	1	9
26:GranSpruce					1	1	1	1		1			5
27:Rendezvous					1	1	1	1		1			5
28:CodyBowl					1	1	1	1		1	1	1	7
29:HeronLk						1	1	1		1	1		5
30:Blacktail							1	1		1	1	1	5
													AVE
Total Sites:	5	2	12	17	24	28	30	30	15	19	20	18	7.52

Figure 1.

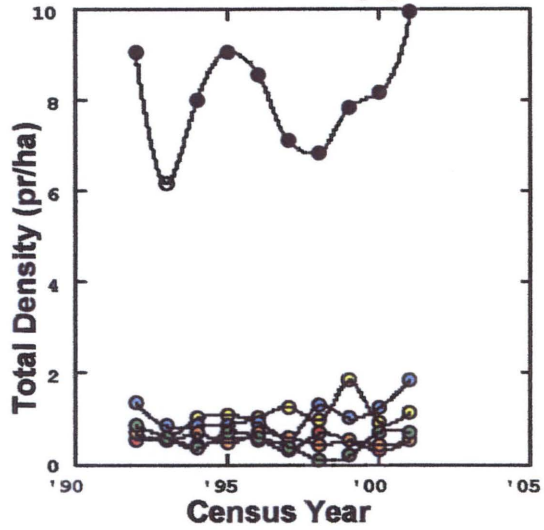




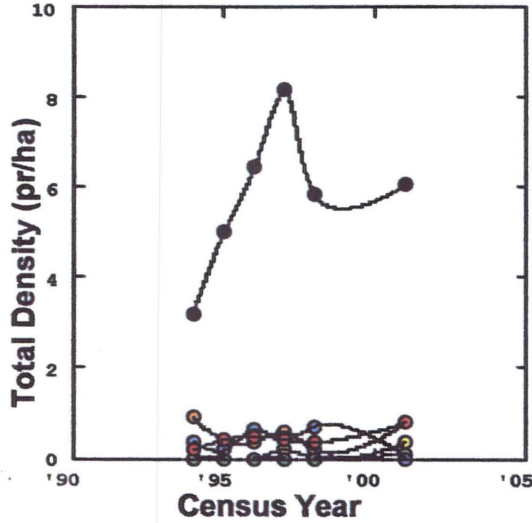
Site 18: Timbered Is Lodgepole



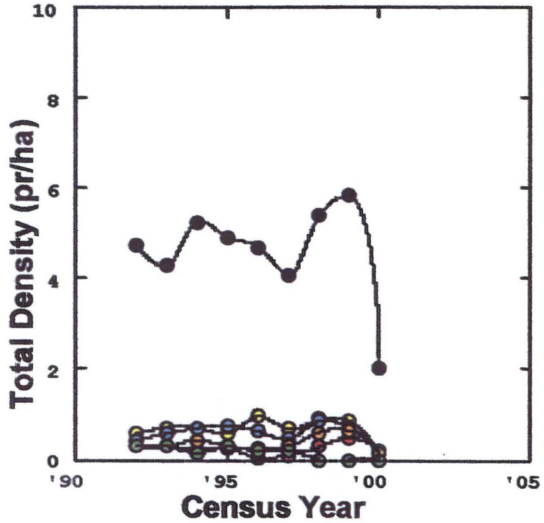
Site 19: AMK Lodgepole



Site 20: Taggart Lake Burn



Site 21: Signal Mt Lodgepole-Spruce



Site 25: Jenny Lake Spruce-Fir

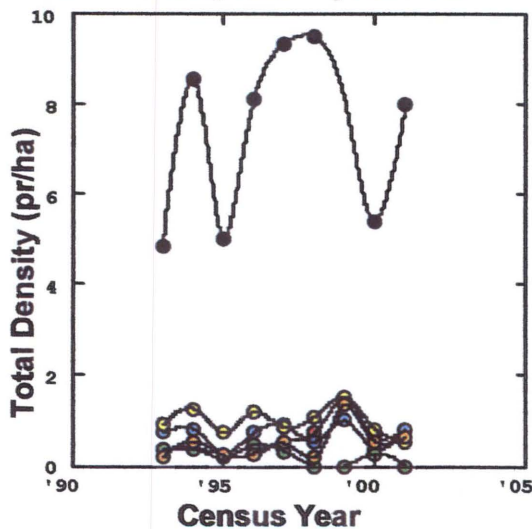


Figure 2.

JACKSON LAKE JUNCTION: SPARROW DENSITIES

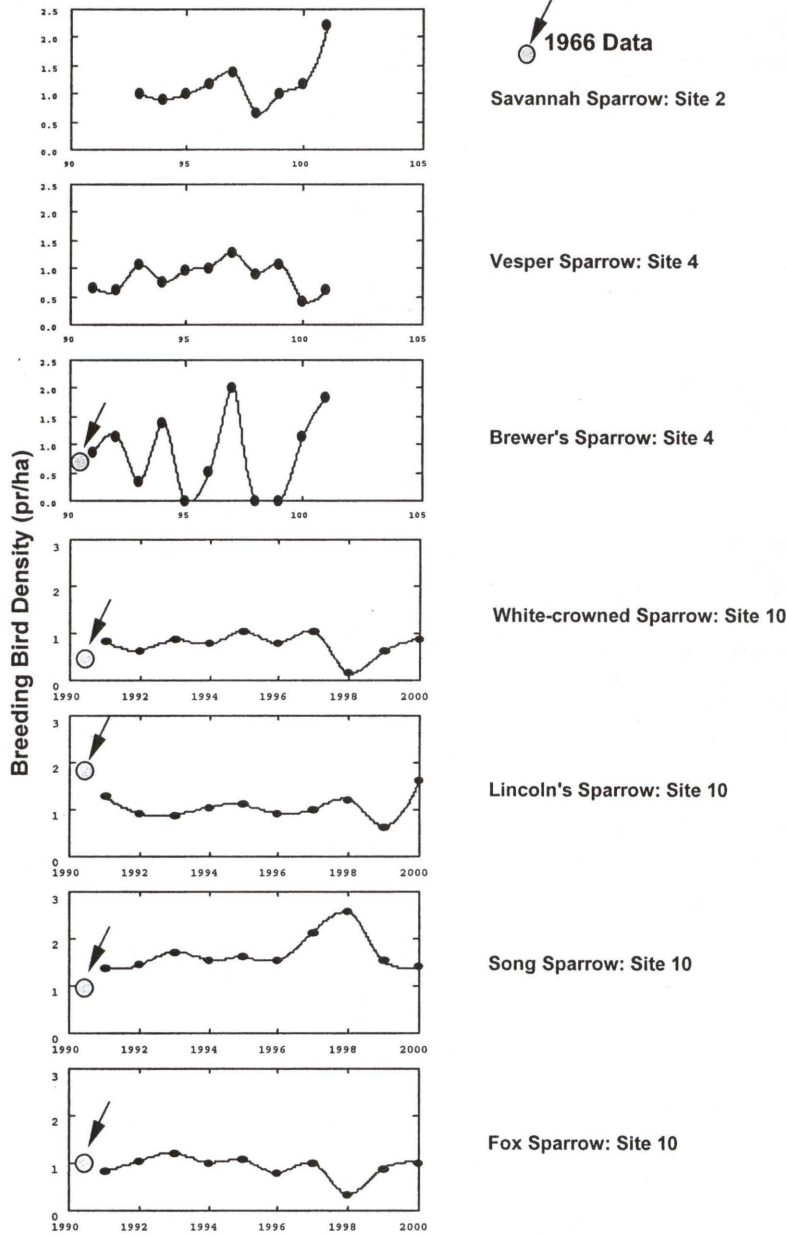
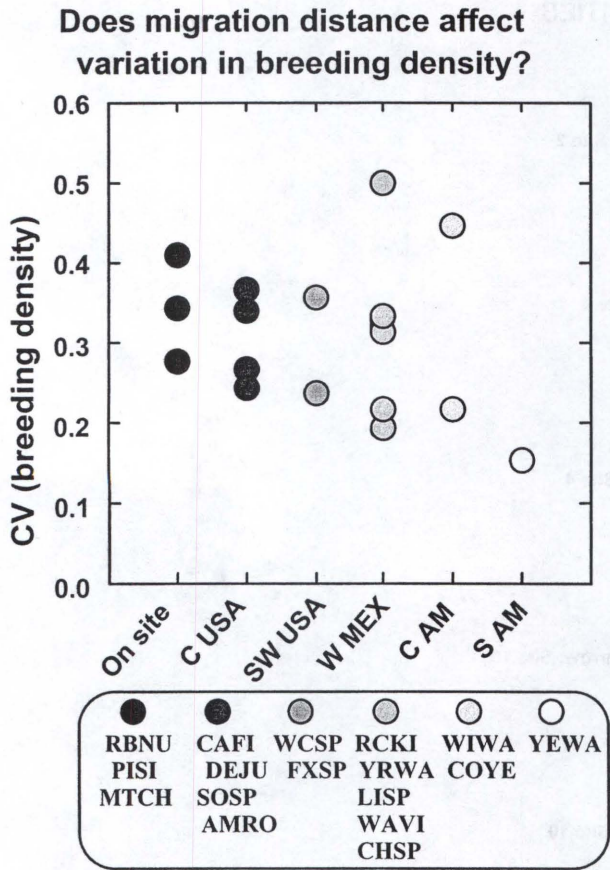


Figure 3.



APPENDIX A

GTNP	MONITORING SITES:	SPECIES LIST 1995-2001
PELECANIDAE	White Pelican	<i>Pelecanus erythrorhynchus</i>
ARDEIDAE	Great Blue Heron	<i>Ardea herodias</i>
GRUIDAE	Sandhill Crane	<i>Grus canadensis</i>
ANATIDAE	Trumpeter Swan	<i>Cygnus buccinator</i>
	Canada Goose	<i>Branta canadensis</i>
	Mallard	<i>Anas platyrhynchos</i>
	Gadwall	<i>Anas strepera</i>
	American Wigeon	<i>Anas americana</i>
	Cinnamon Teal	<i>Anas cyanoptera</i>
	Green-winged Teal	<i>Anas crecca</i>
	Blue-winged Teal	<i>Anas discors</i>
	Redhead	<i>Aythya americana</i>
	Ring-necked Duck	<i>Aythya collaris</i>
	Lesser Scaup	<i>Aythya affinis</i>
	Common Merganser	<i>Mergus serrator</i>
	Barrow's Goldeneye	<i>Bucephala islandica</i>
	Common Goldeneye	<i>Bucephala clangula</i>
	Bufflehead	<i>Bucephala albeola</i>
	Wood Duck	<i>Aix sponsa</i>
RALLIDAE	Virginia Rail	<i>Rallus limicola</i>
	Sora	<i>Porzana carolina</i>
	American Coot	<i>Fulica americana</i>
CHARADRIIDAE	Kildeer	<i>Charadrius vociferus</i>
	Willet	<i>Catoptrophorus semipalmatus</i>
SCOLOPACIDAE	Long-billed Curlew	<i>Numenius americanus</i>
	Spotted Sandpiper	<i>Actitis macularia</i>
	Wilson's phalarope	<i>Phalaropus tricolor</i>
	Common Snipe	<i>Gallinago gallinago</i>
LARIDAE	Franklin's Gull	<i>Larus pipixcan</i>
	California Gull	<i>Larus californicus</i>
	Ring-billed gull	<i>Larus delawarensis</i>
CATHARTIDAE	Turkey Vulture	<i>Cathartes aura</i>
ACCIPITRIDAE	Golden Eagle	<i>Aquila chrysaetos</i>
	Bald Eagle	<i>Haliaeetus leucocephalus</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>

	Swainson's Hawk	<i>Buteo swainsoni</i>
	Osprey	<i>Pandion haliaetus</i>
	Sharp-shinned Hawk	<i>Accipiter striatus</i>
	Cooper's Hawk	<i>Accipiter cooperi</i>
	Northern Goshawk	<i>Accipiter gentilis</i>
FALCONIDAE	American Kestrel	<i>Falco tinnunculus</i>
	Prairie Falcon	<i>Falco mexicanus</i>
	Peregrine Falcon	<i>Falco peregrinus</i>
PHASIANIDAE	Ruffed Grouse	<i>Bonasa umbellus</i>
	Blue Grouse	<i>Dendrogapus obscurus</i>
	Sage Grouse	<i>Centrocercus urophasianus</i>
COLUMBIDAE	Mourning Dove	<i>Zenaidura macroura</i>
STRIGIDAE	Great Gray Owl	<i>Strix nebulosa</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Long-eared Owl	<i>Asio otus</i>
	Short-eared owl	<i>Asio flammeus</i>
	Northern Pygmy-Owl	<i>Glaucidium gnoma</i>
CAPRIMULGIDAE	Common nighthawk	<i>Phalaenoptilus nuttalli</i>
TROCHILIDAE	Calliope Hummingbird	<i>Stellula caliope</i>
	Broad-tailed hummingbird	<i>Selasphorus platycercus</i>
	Rufous hummingbird	<i>Selasphorus rufus</i>
ALCENIDAE	Belted Kingfisher	<i>Ceryle alcyon</i>
PICIDAE	Northern Flicker	<i>Colaptes auratus</i>
	Williamson's Sapsucker	<i>Sphyrapicus thyroides</i>
	Red-naped Sapsucker	<i>Sphyrapicus nuchalis</i>
	Downy Woodpecker	<i>Picoides pubescens</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	Three-toed Woodpecker	<i>Picoides tridactylus</i>
	Black-backed Woodpecker	<i>Picoides arcticus</i>
TYRANNIDAE	Western Wood Pewee	<i>Contopus sordidulus</i>
	Olive-sided Flycatcher	<i>Nuttallornis borealis</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Dusky Flycatcher	<i>Empidonax oberholseri</i>
	Hammond's Flycatcher	<i>Empidonax hammondi</i>
	Least Flycatcher	<i>Empidonax minimus</i>
	Willow flycatcher	<i>Empidonax traillii</i>
	Cordilleran Flycatcher	<i>Empidonax occidentalis</i>

HIRUNDINIDAE	Tree Swallow	<i>Tachycineta bicolor</i>
	Violet-green swallow	<i>Tachycineta thalassina</i>
	Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
	Cliff Swallow	<i>Hirundo pyrrhonota</i>
	Barn Swallow	<i>Hirundo rustica</i>
	Bank Swallow	<i>Riparia riparia</i>
CORVIDAE	Steller's Jay	<i>Cyanositta stelleri</i>
	Gray Jay	<i>Perisoreus canadensis</i>
	Clark's Nutcracker	<i>Nucifraga columbiana</i>
	Black-billed Magpie	<i>Pica pica</i>
	American Crow	<i>Corvus brachyrhynchos</i>
	Common Raven	<i>Corvus corax</i>
PARIDAE	Black-capped Chickadee	<i>Parus atricapillus</i>
	Mountain Chickadee	<i>Parus gambeli</i>
CERTHIDAE	Brown Creeper	<i>Certhia americana</i>
SITTIDAE	White-breasted Nuthatch	<i>Sitta carolinensis</i>
	Red-breasted Nuthatch	<i>Sitta canadensis</i>
TROGLODYTIDAE	Marsh Wren	<i>Cistothorus palustris</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	House Wren	<i>Troglodytes aedon</i>
MUSCICAPIDAE	Golden-crowned Kinglet	<i>Regulus satrapa</i>
Sylviinae	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Mountain Bluebird	<i>Sialia currucoides</i>
Turdinae	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Veery	<i>Catharus fuscescens</i>
	Hermit Thrush	<i>Catharus guttatus</i>
	Swainson's Thrush	<i>Catharus ustulatus</i>
	American Robin	<i>Turdus migratorius</i>
MIMIDAE	Gray Catbird	<i>Dumatella carolinensis</i>
	Sage Thrasher	<i>Oreoscoptes montanus</i>
MOTACILLIDAE	Water Pipit	<i>Anthus spinoletta</i>
CINCLIDAE	American Dipper	<i>Cinclus mexicanus</i>
BOMBYCILLIDAE	Cedar Waxwing	<i>Bombycilla cedrorum</i>
STURNIDAE	European Starling	<i>Sturnus vulgaris</i>
VIREONIDAE	Solitary Vireo	<i>Vireo solitarius</i>

	Warbling Vireo	<i>Vireo gilvus</i>
PASSERIDAE	House sparrow	<i>Passer domesticus</i>
EMBERIZIDAE	Orange-crowned Warbler	<i>Vermivora celata</i>
Parulinae	Yellow-rumped Warbler	<i>Dendroica coronata</i>
	Townsend's warbler	<i>Dendroica townsendi</i>
	Yellow Warbler	<i>Dendroica petechia</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
	Wilson's Warbler	<i>Wilsonia pusilla</i>
	Northern Waterthrush	<i>Seiurus novaboracensis</i>
	Common Yellowthroat	<i>Geothlypis trichas</i>
	American Redstart	<i>Setophaga ruticilla</i>
Emberizinae	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Lazuli Bunting	<i>Passerina amoena</i>
	Spotted towhee	<i>Pipilo maculatus</i>
	Green-tailed Towhee	<i>Pipilo chlorurus</i>
	Vesper Sparrow	<i>Poocetes gramineus</i>
	Savannah Sparrow	<i>Passerculus sandwichensis</i>
	Song Sparrow	<i>Melospiza melodia</i>
	Lincoln's Sparrow	<i>Melospiza lincolni</i>
	Fox Sparrow	<i>Passerella iliacus</i>
	Lark Sparrow	<i>Chondestes grammacus</i>
	Chipping Sparrow	<i>Spizella passerina</i>
	Clay-colored Sparrow	<i>Spizella pallida</i>
	Brewer's Sparrow	<i>Spizella breweri</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
ICTERIDAE	Bobolink	<i>Dolichonyx oryzivorus</i>
	Western Meadowlark	<i>Sturnella neglecta</i>
	Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	Brewer' Blackbird	<i>Euphagus cyanocephalus</i>
	Brown-headed Cowbird	<i>Molothru ater</i>
	Common Grackle	<i>Quiscalus quiscula</i>
	Bullock's Oriole	<i>Icterus bullockii</i>
THRAUPIDAE	Western Tanager	<i>Piranga ludoviciana</i>
FRINGILLIDAE	Pine siskin	<i>Carduelis pinus</i>
	American Goldfinch	<i>Carduelis tristis</i>
	Red Crossbill	<i>Loxia curvirostra</i>
	White-winged crossbill	<i>Loxia leucoptera</i>
	Pine Grosbeak	<i>Pinicola enucleator</i>
	Rosy Finch	<i>Leucosticte arctoa</i>

	Cassin's Finch	<i>Carpodacus cassinii</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Evening Grosbeak	<i>Coccothraustes verpertinus</i>
	To Date: 152 species	