

# GTNP BREEDING BIRD MONITORING PROJECT



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## ♦ OVERVIEW: GTNP BREEDING BIRD MONITORING PROJECT

1. Following initial independent work by M. L. Cody and 3y 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 >30 y; 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.

## ♦ 2002 SEASON: COVERAGE AND PARTICIPANTS

*Participants.* A selection of the 30 monitoring sites was censused by MLC (UCLA) and by Sue Wolff and associates (GTNP). Contact information is given here for the two primary participants:

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### *Site Coverage.*

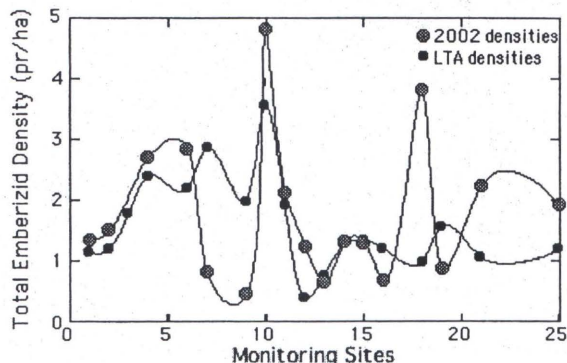
Twenty of the 30 monitoring sites were assessed in 2002. Coverage was continued on sites with the longest monitoring history, which in some cases covers several decades. While coverage spanned a wide range of habitats within the set of monitoring sites (see table 1), high elevation sites were not visited in 2002. The last column of the table indicates those sites monitored in the 2002 season; the selection continues an unbroken continuity of monitoring at important "flagship" sites, and also extends coverage of some less routinely censused areas. Overall, most of the 30 sites have been censused for about a decade.

### The Y2002 Censuses.

The list of breeding species recorded at the monitoring sites (Appendix A) now stands at 153, with the addition in 2002 of Eastern Kingbird. Y2002 was only slightly drier than average, with 573 mm of precipitation during the previous 12 months (August 2001-July 2002), compared to the long-term average of 606 mm. The spring temperatures (APR-JUN) were colder than normal, with monthly mean minima around 0.5 SD below the mean, and monthly mean maxima about normal.

Breeding densities of the more common emberizid species ("sparrows") are summarized in figures 1, 2.

Figure 1



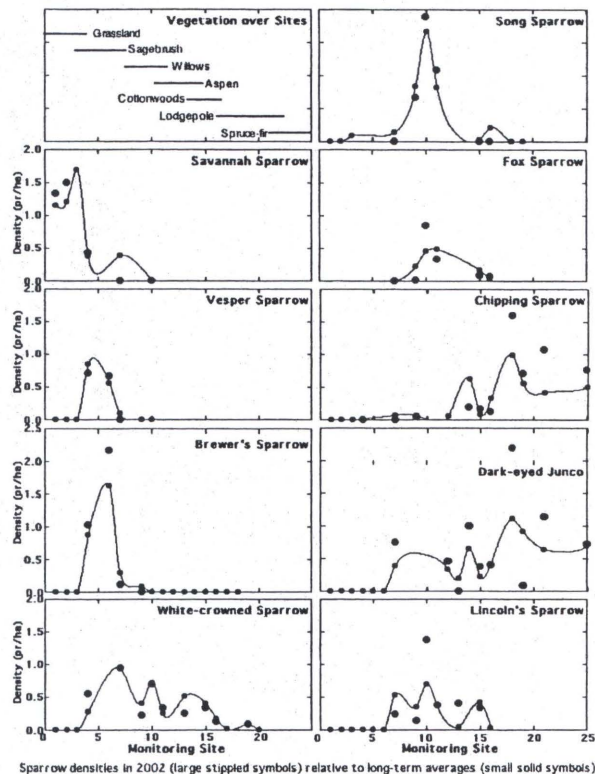
Combined densities of 9 emberizid species over monitoring sites, 2002 data compared to long-term average (LTA) data.

Total density for 9 emberizid species, averaged for each site over the complete data set is represented in the first figure. Density averages over 2 pr/ha from sagebrush through wet shrubby meadows to willows (sites 4-11), is lowest in the aspens (sites 12-14), and varies from 1-1.5 pr/ha in other habitats (grasslands to the left, conifer forest to the right). Data for each of the nine species summed in the first figure are shown separately.

In the second figure, the 2002 census data are shown juxtaposed against each species' average density per site, across all sites. Note that the emberizid species are distributed sequentially across habitats, from Savannah Sparrow in grasslands through Dark-eyed Junco and Chipping Sparrow in the conifer forests. In 2002, Brewer's Sparrow was particularly common in the Airport Sage (Site 6), and Lincoln's Sparrow particularly common in the Wet Willows (Site 10). Both Chipping Sparrow and Dark-eyed Junco were recorded at above average density in most of the forest sites. The potential for relating density variations in the breeding birds to on-

site weather and habitat conditions, and off-site migration and overwintering conditions, increases with every additional year of the monitoring program.

Figure 2



Sparrow densities in 2002 (large stippled symbols) relative to long-term averages (small solid symbols)



Table 1

COVERAGE OF GTNP BREEDING BIRD MONITORING SITES, 1966-200															
															Tot
Site/Censused	66	91	92	93	94	95	96	97	98	99	0	1	2	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	1	11	
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	1	13	
5: Ant.Flats						1	1	1		1	1		1	6	
6: Airpt Sage				1	1	1	1	1	1		1	1	1	9	
7: 2OL Meadow				1	1	1	1	1	1	1	1	1	1	10	
8:Triangle X							1	1			1			3	
9: RKO				1	1	1	1	1	1	1	1	1	1	10	
10:JLJ Will	1	1	1	1	1	1	1	1	1	1	1	1	1	13	
11: Oxbow				1	1	1	1	1	1	1	1	1	1	10	
12: Elk Rch W	1		1	1	1	1	1	1					1	8	
13: Elk Rch E	1		1	1	1	1	1	1	1		1		1	10	
14: Cow Lk	1		1	1	1	1	1	1		1		1	1	10	
15: Spread Ck			1	1	1	1	1	1	1		1		1	9	
16: Schwabch			1	1	1	1	1	1		1		1	1	9	
17: L. Granite						1	1	1			1			4	
18: Timbered Is					1	1	1	1	1	1		1	1	8	
19: AMK			1	1	1	1	1	1	1	1	1	1	1	11	
20: TaggartLk					1	1	1	1	1			1		6	
21: Signal Mt			1	1	1	1	1	1	1	1	1		1	10	
22: Spaulding						1	1	1				1	1	5	
23: LizardCk			1	1	1	1	1	1				1		7	
24: Bradley					1	1	1	1				1	1	6	
25:JennyLk				1	1	1	1	1	1	1	1	1	1	10	
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	11	17	24	28	30	30	15	19	20	18	20	8.22	

## 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>Dendrogeopys 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 hammondii</i>
	Least Flycatcher	<i>Empidonax minimus</i>



	Willow flycatcher	<i>Empidonax traillii</i>
	Cordilleran Flycatcher	<i>Empidonax occidentalis</i>
	Eastern kingbird	<i>Tyrannus tyrannus</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>Dumetella 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>Pooecetes gramineus</i>
	Savannah Sparrow	<i>Passerculus sandwichensis</i>
	Song Sparrow	<i>Melospiza melodia</i>
	Lincoln's Sparrow	<i>Melospiza lincolnii</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>Molothrus 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  
American Goldfinch  
Red Crossbill  
White-winged crossbill  
Pine Grosbeak  
Rosy Finch  
Cassin's Finch  
House Finch  
Evening Grosbeak

*Carduelis pinus*  
*Carduelis tristis*  
*Loxia curvirostra*  
*Loxia leucoptera*  
*Pinicola enucleator*  
*Leucosticte arctoa*  
*Carpodacus cassinii*  
*Carpodacus mexicanus*  
*Coccothraustes verpertinus*

**To Date: 153 species**