

Establishing a Mexican Breeding Bird Survey (BBS) Program

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BBS is an Important Conservation Tool

The North American Breeding Bird Survey (BBS) forms the foundation of non-game, land bird conservation in the U.S. and Canada, providing large-scale, long-term population data for > 400 species. Established in 1966, the (BBS) is a long-term, avian monitoring program with the purpose of providing scientifically credible measures of status and trends of North American bird populations at continental and regional scales to inform biological sound conservation and management actions. These data, along with other indicators, are used by the U.S. Fish and Wildlife Service, Canadian Wildlife Service, state agencies, Partners in Flight and many others to assess avian population trends and set national and regional conservation priorities. Anonymous population trend data are largely unavailable for most of Mexico's breeding bird species, severely limiting bird conservation planning efforts there.

- Currently, the BBS is a joint effort by the U.S. Geological Survey and Canadian Wildlife Service.
- BBS consists of over 4100 roadside routes (Fig. 1) randomly placed throughout the continental U.S. and Canada of which approximately 3000 routes are sampled annually.
- BBS data provide an index of avian population abundance that are used to estimate population trends and relative abundances across various geographic scales.

BBS Methodology

- 24.5-mile (39.2 km) long routes containing 50 stops spaced at 0.5-mile (800-m) intervals are randomly dispersed using a stratified random design.
- Routes are sampled once per year during the height of the breeding season (June for most routes).
- Observers (75% are volunteers) skilled in avian identification collect the data.
- A 3-minute point count is conducted at each stop.
- All birds seen within 0.25-mile (400-m) radius, or heard, are recorded by the observer.
- Sampling begins 30 minutes before local sunrise and takes approximately 4.5 hours to complete.
- Data are either submitted electronically via the Internet, or via the postal service to be scanned by the national BBS office.

Why Establish a Mexican BBS?

The avian conservation community in Mexico has grown substantially in the last decade mirroring their increasing need for better trend assessment of breeding bird populations. Dunn et al. (2005) report that a Mexican BBS program could provide adequate population trend estimates for over 80 species of northern Mexican birds. Although the results of the 3-year pilot project reported here suggest this tool is likely to be much higher, especially as the BBS becomes established throughout Mexico.

In addition to providing vital avian population data for Mexico's conservation efforts, a Mexican BBS would also complete the continental picture for many species whose breeding populations are shared between nations. For example, BBS population trend information for most North American species extends only to the U.S. and Mexican border as depicted by the USGS trend map for Swainson's Hawk (Figure 2) and Painted Bunting (Figure 3). However with the inclusion of data from a Mexican BBS, as simulated by data from the '93-'95 pilot project, a more complete range-wide population picture for these species becomes apparent and available (Figures 2, 3 and 4).

Mexican BBS Background

Efforts to expand the BBS to a truly comprehensive North American program began in earnest in the early 1990s, when the U.S. Fish and Wildlife Service and numerous Mexican and U.S. citizens initiated a 3-year pilot project to examine the feasibility of expanding the BBS into northern Mexico using established BBS methodology. Between 1993 – 1995, 87 routes were sampled in five northern Mexican states by 34 participants:

- 1993 – 26 routes surveyed in four Mexican states: Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas.
- 1994 – 28 routes surveyed including eight in Sonora.
- 1995 – 33 routes surveyed between the five states.

A total of 218 species was detected (Table 1), including 29 ranked of continental importance in the Partners in Flight's Southwest Avifaunal Biome (Rich et al. 2004; species in blue).

Lessons Learned:

- ▶ Existing BBS methodology feasible for sampling bird populations in northern Mexico.
- ▶ At that time, operational infrastructure and skilled volunteer base lacking to sustain program.
- ▶ Research needed to further evaluate/optimize for sub-tropical habitats of southern Mexico.

Fig. 1. BBS route location figure including locations of 1993-1995 Mexican pilot project routes

Future Directions

Mexico's National Commission for the Knowledge and Use of Biodiversity has partnered with the U.S. Geological Survey and Canadian Wildlife Service in developing a Mexican Breeding Bird Survey program to be implemented by 2010. Current efforts include:

- Conducting a workshop at 4th NAOC to help partners identify and identify participants, outline implementation plan, and identify program needs and time line.
- Evaluating an optimal BBS methodology for Mexico.
- Developing training courses.
- Establishing randomized BBS routes.

To learn more about, or assist with, the Mexican BBS program please contact: Humberto Berlanga, CONABIO (hberlanga@xolo.conabio.gob.mx; 55-5004-5000) Keith Pardieck, USGS (kpardieck@usgs.gov; 301-497-5843) Connie Downes, CWS (connie.downes@ec.gc.ca; 613-989-4459)

Fig. 2. Swainson's Hawk trend map 1966-2003, with Mexican trend simulated from pilot project

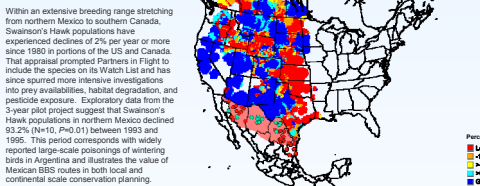


Fig. 3. Painted Bunting trend map 1966-2003, with Mexican trend simulated from pilot project

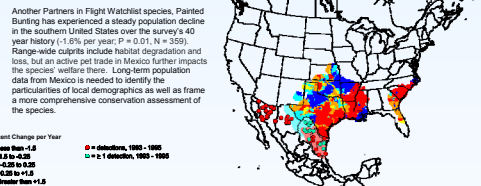
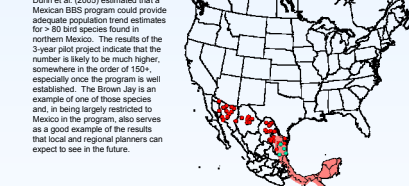


Fig. 4. Brown Jay simulated trend map 1966-1995



English Name	Scientific Name	Total Ind.	Routes	English Name	Scientific Name	Total Ind.	Routes
Trumpet Sparrow	<i>Cathartes aura</i>	41	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Black-bellied Whistling Duck	<i>Dendrocygna autumnalis</i>	117	3	Blue Grosbeak	<i>Myiobus cyaneus</i>	250	20
Yellow-billed Cuckoo	<i>Coccyus americanus</i>	2	1	Indigo Bunting	<i>Pipilo erythrophthalmus</i>	486	10
Mourning Dove	<i>Quercus macrocarpa</i>	7	2	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Blue Jay	<i>Cyanus cristatus</i>	21	6	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Rusty Duck	<i>Oryzopsis yamensis</i>	13	1	Parula Warbler	<i>Parula carolinensis</i>	436	20
Plain Chalcid	<i>Ornithogaster</i>	369	5	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Chimney Swift	<i>Chimney Swift</i>	1	1	Blue Grosbeak	<i>Myiobus cyaneus</i>	250	20
Willet Turkey	<i>Meleagris gallopavo</i>	449	10	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Scrub Wren	<i>Salpinctes obsoletus</i>	48	2	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Swainson's Hawk	<i>Buteo swainsoni</i>	32	13	Painted Bunting	<i>Passerina ciris</i>	319	13
Mountain Quail	<i>Turnix sylvaticus</i>	12	3	Spice-wind	<i>Spizella monticola</i>	12	1
Mountain Duck	<i>Ardea herodias</i>	4	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Neotropical Cormorant	<i>Phalacrocorax auritus</i>	7	2	Blue Grosbeak	<i>Myiobus cyaneus</i>	250	20
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	3	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Great Blue Heron	<i>Ardea herodias</i>	14	8	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Great Egret	<i>Ardea herodias</i>	9	2	Painted Bunting	<i>Passerina ciris</i>	319	13
Snowy Egret	<i>Egretta thula</i>	38	4	Spice-wind	<i>Spizella monticola</i>	12	1
Tricolored Heron	<i>Egretta tricolor</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Cattle Egret	<i>Bubulcus ibis</i>	53	8	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Great Heron	<i>Egretta thula</i>	9	6	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
White Ibis	<i>Egretta thula</i>	3	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Black Vulture	<i>Corvus calurus</i>	6	2	Spice-wind	<i>Spizella monticola</i>	12	1
Turkey Vulture	<i>Cathartes aura</i>	137	41	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Osprey	<i>Pandion haliaetus</i>	3	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
White-tailed Kite	<i>Haliaeetus leucos</i>	6	4	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Northern Harrier	<i>Circus cyaneus</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Cooper's Hawk	<i>Accipiter cooperii</i>	4	2	Spice-wind	<i>Spizella monticola</i>	12	1
Gray Hawk	<i>Accipiter cooperii</i>	2	2	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Common Goldeneye	<i>Branta canadensis</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Harris Hawk	<i>Parabuteo unicinctus</i>	10	25	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Red-tailed Hawk	<i>Buteo swainsoni</i>	6	3	Painted Bunting	<i>Passerina ciris</i>	319	13
Swainson's Hawk	<i>Buteo swainsoni</i>	68	14	Spice-wind	<i>Spizella monticola</i>	12	1
White-tailed Hawk	<i>Buteo albicaudatus</i>	4	3	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Red-tailed Hawk	<i>Buteo swainsoni</i>	127	33	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Golden Eagle	<i>Aquila chrysaetos</i>	3	3	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14

English Name	Scientific Name	Total Ind.	Routes	English Name	Scientific Name	Total Ind.	Routes
Swainson's Hawk	<i>Buteo swainsoni</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Mourning Dove	<i>Quercus macrocarpa</i>	37	8	Blue Grosbeak	<i>Myiobus cyaneus</i>	250	20
Yellow-billed Cuckoo	<i>Coccyus americanus</i>	79	22	Indigo Bunting	<i>Pipilo erythrophthalmus</i>	486	10
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	2	2	Parula Warbler	<i>Parula carolinensis</i>	436	20
Falco sparverius	<i>Falco sparverius</i>	3	3	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	13	2	Blue Grosbeak	<i>Myiobus cyaneus</i>	250	20
Falco sparverius	<i>Falco sparverius</i>	2	2	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	3	3	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	10	12	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	7	3	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	12	4	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	3	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	19	11	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	2	4	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	7	4	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	2	4	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	8	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
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Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
Falco sparverius	<i>Falco sparverius</i>	1	1	Painted Bunting	<i>Passerina ciris</i>	319	13
Falco sparverius	<i>Falco sparverius</i>	1	1	Spice-wind	<i>Spizella monticola</i>	12	1
Falco sparverius	<i>Falco sparverius</i>	1	1	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	45	5
Falco sparverius	<i>Falco sparverius</i>	1	1	Yellow-eyed Junco	<i>Junco phaeonotus</i>	66	4
Falco sparverius	<i>Falco sparverius</i>	1	1	Carolinian Chickadee	<i>Parus carolinensis</i>	436	14
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