

# 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) is a population of continental land bird conservation by the U.S. and Canadian provincial governments, for monitoring avian data for over 400 species. Established in 1966, the (BBS) is a long-term, avian monitoring program with the purpose of providing scientifically measures of status and trends of North American bird populations at continental and regional scales to inform biologically 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. Analogous 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 4000 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% 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.

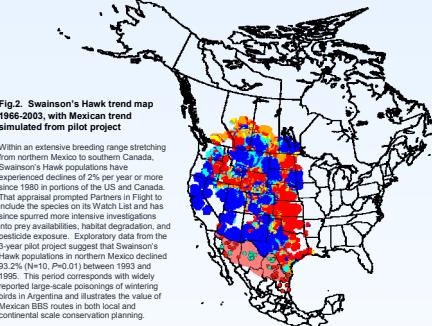
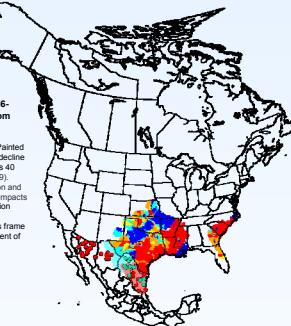


Fig. 2. Swainson's Hawk trend map 1966-2003, with Mexican trend simulated from pilot project

Within an extensive breeding range stretching from northern Mexico to southern Canada, Swainson's Hawk populations have experienced a decline of 10% or more since 1980 in portions of the U.S. and Canada. This appraisal prompted Partners in Flight to initiate a pilot project to determine if data from Mexico were needed to identify the particulars of local demographics as well as frame a more comprehensive conservation assessment of the species.

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

Another Partners in Flight Watchlist species, Painted Bunting has experienced a steady population decline in the southern United States since the survey's 40 year history began in 1970 (~+0.2%/year). Range-wide cutbacks include habitat degradation and loss, but an active pet trade in Mexico further impacts the species. The lack of historical population data from Mexico is needed to identify the particulars of local demographics as well as frame a more comprehensive conservation assessment of the species.



Percent Change per Year

Less than -1.0  
-1.0 to -0.5  
-0.5 to 0.5  
0.5 to 1.5  
Greater than +1.5

## Why Establish a Mexican BBS?

The avian conservation community in Mexico has made substantial strides in the last decade monitoring their increasing need for more assessment of breeding bird populations. During the (2005) report to 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 that total 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 maps 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 Survey in developing a Mexican Breeding Bird Survey program to be implemented by 2010. Current efforts include:

- Conducting a workshop at 4th NAOIC to form partnerships 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:  
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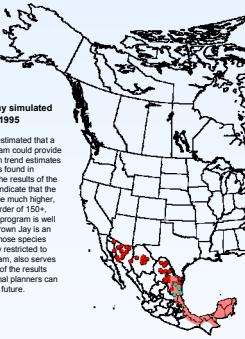
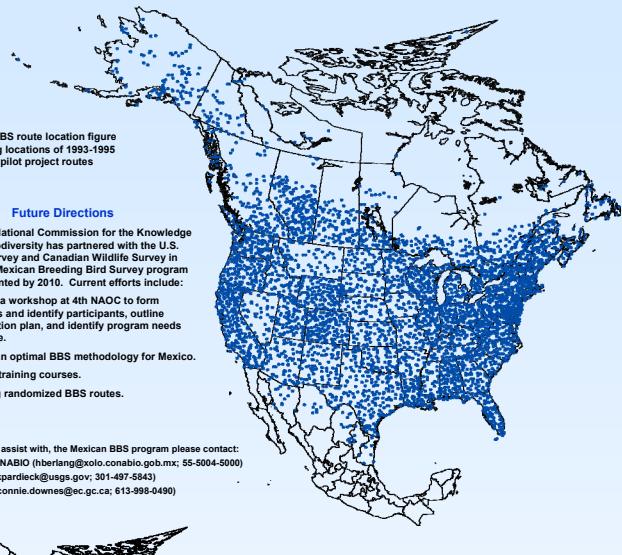


Fig. 4. Brown Jay simulated trend map 1993-1995

Dunn et al. (2005) estimated that a Mexican BBS program could provide adequate population trend estimates for > 80 bird species found in northern Mexico. The number of species in the 3-year pilot project indicate that the number is likely to be much higher, among them 30 species of concern, especially once the program is well established. The Brown Jay is an example of a species of concern and, in being largely restricted to Mexico in the program, also serves as a good example of the results that local and regional planners can expect to see in the future.



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Mexican Pilot Project Participants: Miguel Angel Cruz, Guadalupe Avila, Alejandra Carrera, Carlos Castillo, Mario Ciretti-Galan, Enrique Cisneros, Jorge Francisco, Daniel Garza, Adolfo Gomez, Carmen Gonzalez, Antonio Guerra, Martin Haro, Guillermo Herrera, Benito Leal, Gabriela Leon, Arturo Lemus, Bonnie McKinney, Cristina Meleñez, Cesar Medina, Guadalupe Morales, Arnulfo Moreno-Valdez, Rafael Paredes, Eva Rogero, Teresa Solis, Mario Trevino, Jose Trevino, Julian Trevino-Huarr, Adolfo Villareal, and Roberto Zapata.

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Table 1. Species detected during Mexican Pilot Project 1993-1995  
(blue = PIF Watchlist species)

English Name	Scientific Name	Total Ind.	Routes	English Name	Scientific Name	Total Ind.	Routes
Trooper Thrush	Cathartes aura	41	5	Colored Forest-Falcon	Micrastur semitorquatus	1	1
Black-bellied Whistling-Duck	Dendrocygna autumnalis	117	5	Common Curassow	Crax jacchus	37	8
White-fronted Whistling-Duck	Dendrocygna bicolor	2	1	Greater Prairie-Chicken	Tetrao urogallus	79	22
Massey's Duck	Callonetta melanotos	7	2	Bat Falcon	Falco rufigularis	1	2
Macaulay Duck	Anas diazi	21	6	Peregrine Falcon	Falco peregrinus	2	2
Macmillan Duck	Anas diazi	13	3	Red-tailed Hawk	Buteo jamaicensis	3	3
Riley Duck	Anas diazi	369	5	Red-tailed Hawk	Buteo jamaicensis	13	2
Plain Chachalaca	Otus leuconotus	1	1	Ornate Hawk-Eagle	Spizaetus ornatus	41	1
Created Quail	Perdicula asiatica	1	1	Red-tailed Shrike	Lanius excubitor	2	1
Wild Quail	Meleagris gallopavo	43	10	Black-bellied Hummingbird	Archilochus alexandri	8	3
Scaled Quail	Colinus squamatus	446	20	Blue-throated Hummingbird	Archilochus colubris	2	3
Scaly-naped Puffin	Fratercula cirrhata	6	1	Costa's Hummingbird	Amazilia tzacatl	13	3
Gambel's Quail	Colaptes gambeli	725	13	Costa's Hummingbird	Amazilia tzacatl	42	4
Northern Bobwhite	Colinus virginianus	311	13	Red-tailed Pigeon	Patagioenas fasciata	95	4
Montezuma Quail	Coturnix montezumae	12	3	Band-tailed Pigeon	Patagioenas fasciata	1	1
Mountain Quail	Coturnix collaris	4	2	White-winged Dove	Zenaidura macroura	2625	42
Neotropic Cormorant	Phalacrocorax neotropicus	7	2	Mountain Quail	Zenaidura macroura	1	1
Double-crested Cormorant	Phalacrocorax auritus	3	1	White-winged Dove	Zenaidura macroura	236	1
Great Blue Heron	Ardea herodias	14	8	Common Ground-Dove	Columba palumbus	100	15
Great Egret	Ardea alba	9	2	Common Grackle	Quiscalus quiscula	1	1
Common Moorhen	Gallinula chloropus	38	4	Common Nighthawk	Chordeiles minor	113	1
Little Blue Heron	Egretta caerulea	1	1	Common Potoo	Aegotheles cristatus	23	5
Tricolored Heron	Egretta tricolor	1	1	Common Poorwill	Nyctiphrynus xanthostomus	40	2
Cattle Egret	Bubulcus ibis	53	8	Common Roseate Spoonbill	Rosea rubra	2	1
Bitterns	Bubulcus ibis	6	2	Common Tern	Sterna hirundo	1	1
White-tailed Kite	Elanus leucurus	25	1	Common Yellowthroat	Icterus spurius	10	4
White-tailed Kite	Elanus leucurus	1	1	Common Yellowthroat	Icterus spurius	11	4
Horned Lark	Eremophila alpestris	25	1	Greater Prairie-Chicken	Tetrao urogallus	19	4
Gray Hawk	Butastur teesa	4	2	Greater Prairie-Chicken	Tetrao urogallus	20	5
Common Ground-Hawk	Buteo swainsoni	110	25	Lesser Prairie-Chicken	Tetrao pallidus	51	1
Hen's Hawk	Buteo swainsoni	6	3	Common Nighthawk	Chordeiles minor	102	13
Rosada Hawk	Buteo magnirostris	3	1	Common Nighthawk	Chordeiles minor	103	13
White-tailed Hawk	Buteo albicauda	127	35	Common Poorwill	Caprimulgus carolinensis	1	1
White-tailed Hawk	Buteo jamaicensis	127	35	Common Poorwill	Caprimulgus carolinensis	1	1
Golden Eagle	Aquila chrysaetos	5	3	White-throated Swift	Aeronautes saxatalis	2	1

English Name	Scientific Name	Total Ind.	Routes	English Name	Scientific Name	Total Ind.	Routes
Rock Wren	Salpinctes obsoletus	824	28	Snowy Owl	Bubo scandiacus	611	27
Scrub Jay	Garrulus glandarius	10	2	Sooty Gull	Larus pacificus	1	1
Mountain Bluebird	Sialia currucoides	60	10	Osprey	Pandion haliaetus	2	1
Blue Grosbeak	Passerina cyanea	18	5	Ring-billed Gull	Larus delawarensis	40	5
Blue Grosbeak	Passerina cyanea	6	1	Song Sparrow	Zonotrichia leucophrys	40	5
Blue Grosbeak	Passerina cyanea	27	5	Thick-billed Gull	Larus ridibundus	1	1
Yellow-eyed Junco	Junco phaeonotus	37	7	House Wren	Troglodytes aedon	64	4
Junco Phainopepla	Phainopepla nitens	34	7	Grayish Shrike	Lanius excubitor	1	1
Cardinal	Cardinalis cardinalis	430	29	Blue-gray Gnatcatcher	Polioptila caerulea	34	7
Cardinal	Cardinalis cardinalis	394	20	Polyanthus melanocephalus	Polyanthus melanocephalus	52	8
Blue Grosbeak	Passerina cyanea	26	4	Rock Wren	Salpinctes obsoletus	3	1
Black-headed Grosbeak	Pheucticus melanocephalus	45	5	Summer Tanager	Piranga rubra	5	4
Yellow-faced Grosbeak	Psarocolius viridis	8	1	Hooded Oriole	Oriolus oriolus	15	16
Yellow-faced Grosbeak	Psarocolius viridis	35	2	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	22	1	Orchard Oriole	Icterus spurius	15	16
Yellow-shafted Flicker	Colaptes auratus	252	4	Orchard Oriole	Icterus spurius	1	1
Tropical Parula	Parula pitiayumi	35	2	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	6	1	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	12	2	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	23	4	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	25	4	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	26	4	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	27	4	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	28	4	Orchard Oriole	Icterus spurius	1	1
Yellow-shafted Flicker	Colaptes auratus	29	4	Orchard Oriole	Icterus spurius	1	1
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