

## Progression of the North American Breeding Bird Survey (BBS) and Future Directions

Inaugurated in 1966, the BBS recently celebrated its 45th year of serve as the primary source of large-scale, long-term population data for over 400 of North America's breeding bird species. Each year these data, as well as the relative abundance and trend estimates derived from them, inform Federal, State and private entities in identifying at-risk bird species and planning avian conservation strategies. As new analytical methods and spatial technologies emerge, the USGS continues to affirm its commitment to meeting developing science needs through ongoing improvement of the survey's core strengths. Current efforts include:

### Improvements to the Survey's Analytical Framework

#### Strengthening Trend Estimation:

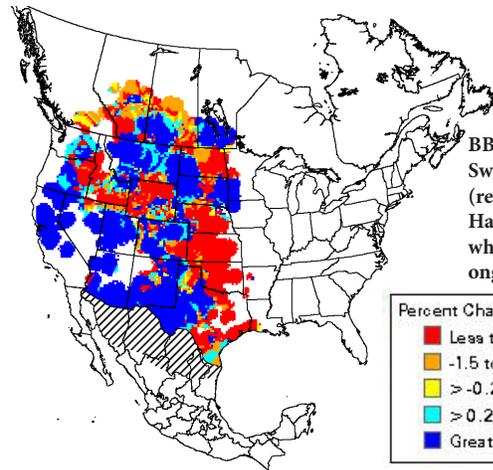
- Recent implementation of a hierarchical Bayesian model that allows direct accounting of dependent variable effects and improves trend estimate precision.
- Developed species detection models to mitigate effects of directional biases in data set (e.g., increases in ambient noise over time, etc) yielding increased trend estimate precision using existing field protocols.

#### Crafting a Foundation for Environmental Change Research:

- Designed a spatially explicit analytical model for use with BBS data that permits geo-spatial inference – a vital step in evaluating sampling and adaptive monitoring components that will permit tailored monitoring of target ecosystems and/or species, regional management actions, localized disasters, etc.

#### Advancing Estimates of Population Size:

- Research evaluating the promise of emerging species detection models for estimating density estimates from BBS data is currently underway a breakthrough that, if successful, could allow enumeration of whole populations.



### Improvements in Data Breadth and Collection

- An additional 32 years of BBS point-count data, including over 125,000 unique locations, will become available in 2012 upon completion of an ongoing multi year, 120 million-keystroke project a key resource that will extend research on the influence of historic climate and land use change on birds.
- The BBS has begun development of a robust coordinate collection, management, and delivery system that will transition the survey from a route level structure to one offering information at actual survey locations.
- The multinational USGS, CWS, CONABIO (Mexican National Committee for the Knowledge and Use of Biodiversity), and USFWS partnership despite the recent social challenges along the border - a significant step toward making the BBS truly comprehensive of with Mexico of North America's shared bird populations.



Swainson's Hawk

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Historical Point-Count Data

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