What is IMBCR?

IMBCR stands for **Integrated Monitoring in Bird Conservation Regions**. The program was created to address large-scale declines of avian populations and the need for extensive and rigorous landbird monitoring. IMBCR operates as a partnership (led by Bird Conservancy of the Rockies) with multiple federal and state agencies and NGO's who contribute funding or field capacity.

What is IMBCR's temporal and spatial extent?

IMBCR began in Colorado in 2008 and has since expanded across the Great Plains to the Great Basin. It is now the second largest bird monitoring program in the country, encompassing Colorado, Montana, Utah, Wyoming, and portions of 12 other states.

IMBCR survey extent as of 2021.

How are the data collected?

Every spring, dozens of observers skilled in bird ID are trained on IMBCR protocol and sent into the field to collect data at random survey sites. This consists of visiting a 1-km^2 survey site per morning, which contains 16 evenly spaced point count stations. At each point, observers record ocular vegetation estimates, like average shrub cover and height. They then record all birds detected within a 6-min interval including the distance to each bird. These methods allow us to estimate the proportion of birds present but not detected at a survey (i.e., detection probability).
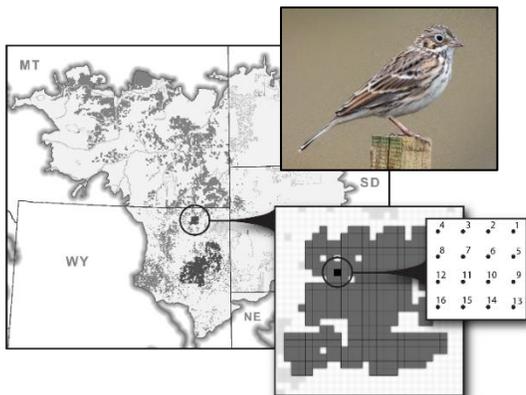
Example sampling frame for the Badlands and Prairies Bird Conservation Region with 1-km^2 grid cells and example grid cell containing 16 point count stations.

Do you survey on private land too?

Yes, IMBCR is an all-lands monitoring program. Our landowner liaison researches ownership for each survey site and contacts landowners requesting permission for access. We only survey approved survey sites. All landowner information is stored in a secure database to maintain anonymity. See **Landowner FAQ's** for additional information.

What are Bird Conservation Regions?

Bird Conservation Regions (BCRs) represent ecologically distinct plant and bird communities and form the basis for IMBCR's sampling design. Within a sampling frame, all lands are available for sampling and all vegetation types are included, so we can make inference about bird populations across private and public lands and all habitats.

How are sampling frames stratified?

Within BCRs, we create strata based on fixed attributes, such as state borders or management unit boundaries. Stratification is determined by funding partners based on areas to which they wish to make inference about bird populations. With a nested sampling design, we can estimate bird population size within a smaller management unit (e.g., National Forest) up to a state or larger region. Because of spatially balanced transect selection, partners can adjust monitoring efforts while maintaining spatial coverage of a stratum.

Why do we need another monitoring program when we have the Breeding Bird Survey (BBS)?

BBS data span the continental US and portions of Canada and Mexico, and date back to the 1960's. They provide relative trend in bird populations over time and are freely available to the public. As such, BBS data are frequently used to assess regional populations.

However, BBS surveys are conducted along roads, so coverage may be sparse in areas with limited road access, and inference about bird populations is restricted to habitats along roads. BBS data also provide inference about bird populations at large scales, such as a state, but we cannot make inference to smaller management units. Further, biologists often need estimates of population size, not just trend, to make informed decisions. Estimating population size requires accounting for birds that are present but not detected during a survey, which we accomplish with IMBCR methods.

What results are produced with IMBCR?
We estimate bird density, occupancy, and population size at a variety of scales from a National Forest to a state or BCR. Population trend is also available and includes a level of certainty about the estimate (how sure are we the population is increasing or decreasing?). These estimates are available for about 300 different species including songbirds, game birds, common raptors, and some waterfowl and shorebirds.

Are IMBCR data available to the public?
Survey results and population estimates are available to the public on the Rocky Mountain Avian Data Center. General survey locations are included, but zoom capability is restricted to protect private landowner privacy. Partners have access to the raw data they fund or collect including detections and survey locations. IMBCR data are available to those outside of the IMBCR Partnership upon request and approval of a data sharing agreement. Complete this form to request raw data.

What are overlay projects? Overlay projects are designed to answer specific questions about the impact of management actions, conservation efforts, or natural disturbances on bird populations. They use the same IMBCR field methods and sample selection, which allows us to leverage detection data from across the program to estimate population size for infrequently detected species and place them in regional context. For example, are pygmy nuthatch densities higher in a restoration project area compared to the surrounding Forest?

What are some examples of how the data are used? Partners use IMBCR data for a variety of purposes. State-wide trends inform Species of Greatest Conservation Need in state wildlife action plans. Density estimates allow biologists to determine potential migratory bird impacts for project planning, and also habitat-specific impacts. Abundance estimates allow us to determine stewardship or what proportion of a species regional population resides within a state or management unit during the breeding season. Through overlay projects and additional analyses, partners ask specific questions about landuse impacts on birds. In one overlay project, we monitored birds inside and outside a natural gas development area to determine the impact on sagebrush-obligate species and set management triggers for the Wyoming BLM. Playa Lakes Joint Venture uses the monitoring data to predict species distributions across the region and to answer specific management questions posed by regional partners. For example, how do different thresholds of mesquite affect grassland bird occupancy? Visit this spreadsheet for past and current overlay projects and data applications.

Bird Conservancy of the Rockies