

Last Month's Program: *Brown-capped Rosy-Finches*

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NOTE: A video of the January program can be seen on the [DFO website](#). Select Past Programs and click on the arrow icon to the right of the program title.

DFO's first program of 2018 featured Colorado's iconic and near-endemic Brown-capped Rosy-Finch (BCRF) and was given by Garth Spellman, Curator of Ornithology at Denver Museum of Nature and Science.

Dr. Spellman's major research interest is a central question in evolutionary biology: how changes in the environment faced by a species show up in that species' genes.

He described the organization and objectives of an ongoing study of BCRF involving many institutions, including DMNS, the Bird Conservancy of the Rockies, and the University of California at Los Angeles and Santa Cruz.

The project aims to obtain enough genetic and behavioral information about this poorly-studied bird to inform conservation strategies and clarify its relationship to other members of the rosy finch complex.

The BCRF is North America's highest altitude breeding bird. It is close to endemic to Colorado, some breed in Wyoming and, at one time, they bred in New Mexico.

Nesting occurs on cliff faces, making nesting studies a dicey proposition.

During breeding season, they feed on wind-blown insects and seeds that accumulate on snowfields.

In winter they descend to lower elevations and flock with two other

North American species, the Gray-crowned Rosy-Finch and the Black Rosy-Finch.

In addition to detailing the distribution of BCRF, the project includes other specific objectives and questions to be answered.

One of these is population trends. The current estimate of the BCRF population is about 45,000 birds. One hundred years ago, this number could have been 1 million or more.

Studies on recruitment of BCRF, based on the fraction of 2nd-year birds in the total population, indicate that the species is rapidly losing ground.

This is confirmed by Christmas Bird Count data, which suggest that the birds are declining at a rate of 3.7% per year.

By contrast, the Black and Gray-crowned species recruitment ratios suggest stable populations at present. Why does the BCRF differ?

Climate change effects are also being studied. One important factor for BCRF survival is snowfields, which trap food during breeding season.

Snow and ice groundcover in their breeding range has decreased about 40% in the last half-century. Has this affected the birds' breeding success?

Movement patterns are also of interest. A key question for potential managers and geneticists is whether BCRF exists in Colorado as a mixed breeding population or a collection of isolated populations.

Limited data obtained from band

recapture studies suggest that the birds only move 30 miles or so between winter and summer ranges.

See Dr. Spellman's article in this issue for details.

Genetic analysis is being done, as well. DNA sequencing will be conducted on 60 birds. Although most of the birds are BCRF, representatives from the 4 Asian rosy finch species and the other two North American species are included.

These data will help answer a number of questions, such as how different are the three recognized North American species from one another?

How closely related are they to Asian species?

Is the BCRF the youngest, as range data suggest?

Do BCRF have any adaptive genes, for example, relating to temperature and altitude tolerance?

Do sequence data support a mixed breeding population or isolated populations?

Hopefully, genome sequencing will identify short sequences specific to defined geographic populations, so that a single feather could quickly and inexpensively identify where a bird came from.

Other objectives and future directions for the project include chemical and isotopic analysis of feather samples to assess food sources and stress levels, measurements of annual survival, effects of disease, and studies of competitors, like the American Pipit or, interestingly, introduced fish which could compete for insects.