

Monitoring migration and nonbreeding season habitat and status of Golden-winged and Cerulean warblers using Priority Migrant eBird

Sara Barker Swarthout and Kenneth V. Rosenberg

Cornell Lab of Ornithology 

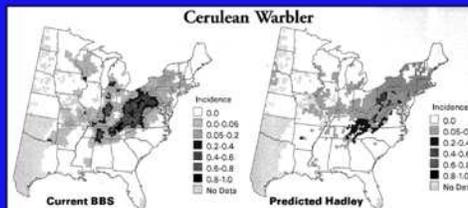


I'm going to report on the status of ongoing monitoring efforts and an application that we've created to help centralize distributional data for cerulean warblers and golden-wings in the non-breeding season, and present some initial summary information from existing historical and present day records and hopefully entice some of you to get more involved.

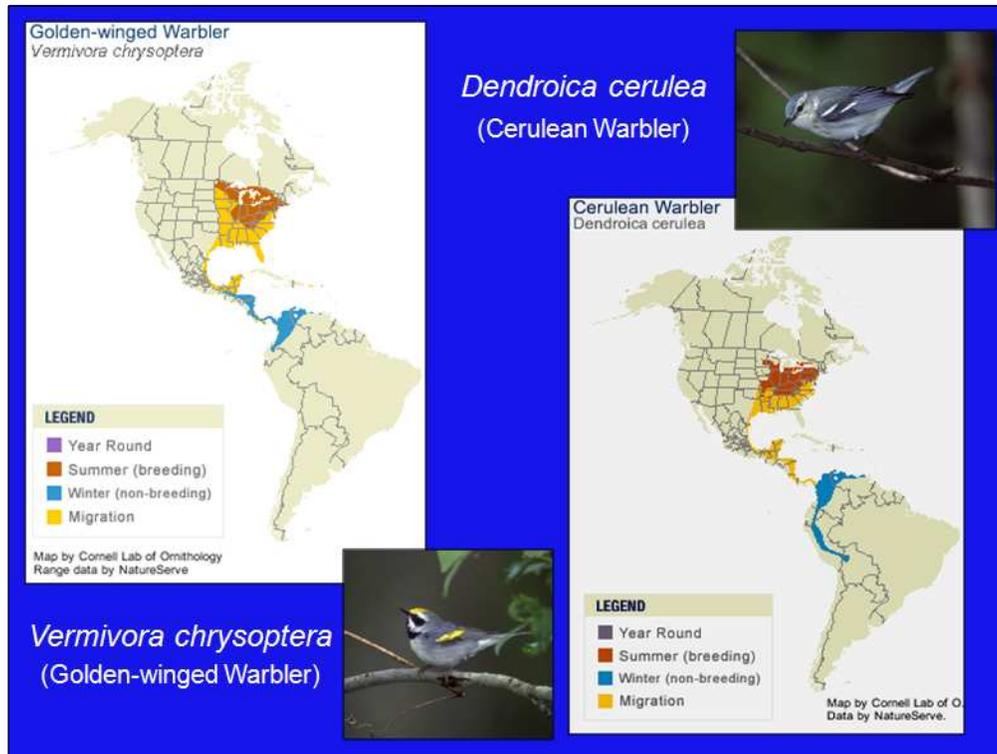


Requirements for successful conservation strategies

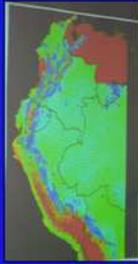
- Threats throughout the life cycle.
- **Detailed knowledge of bird distributions throughout the Americas.**
- Determination of where limiting factors are occurring.



In order to develop a full life cycle conservation strategy and before developing species specific monitoring protocols we must start with a detailed knowledge of the distribution of a particular species. Yet today our knowledge of many migratory species outside their breeding grounds is extremely limited due to fewer field studies and the difficulty of sharing data, as the task of bringing together disparate and often unpublished information on field observations and species collections has been daunting. In this talk I'll focus on compiling broad information and establishing a baseline for monitoring during the non-breeding season. The workshop that Pete Marra, Ken Rosenberg, and others are going to conduct at the close of summit will build on this baseline information and distribution data by developing standardized protocols for monitoring winter migrants that really don't exist at present.



For cerulean and golden-winged warblers much of the distribution information that we have currently is in the form of colored range maps in field guides and those presented by NatureServe. The threats and limiting factors most frequently mentioned are destruction of breeding and wintering habitat and both are known to be declining precipitously in the majority of their ranges, yet little is known of their distribution and specific habitat needs during the winter or migration seasons. We need more details before we can begin to make conservation decisions. As you've started to hear in the earlier sessions at this meeting, conservation initiatives have formed with groups of experts studying these birds and working together to develop management plans that address the declines. As I believe we'll hear more about later in this session, there are ongoing efforts to compile detailed distribution information, develop habitat models, and identify critical sites for conservation action.



Priority Species Working Groups

El Grupo Ceruleo/Alianza Alas Doradas

- Golden-wing workshop in Wisconsin –August, 2005
- Cerulean workshop in Ecuador – November, 2005
- Action item: develop new monitoring program for high priority species on migratory and wintering grounds.
- CLO development of new priority species application.



In 2005, two working groups were created from these initiatives to address conservation questions and increase awareness concerning their wintering ground needs. Alianza Alas Doradas and El Grupo Ceruleo, first met in Wisconsin and Ecuador with representatives from 8 countries. An important action item emerged to develop a new program using existing web-based applications to fill gaps in our knowledge of these species' distribution during migration and winter, to maximize the number of people providing data in a central location, and to minimize the effort needed to contribute these records.

Priority Migrant eBird

- Collect non-breeding distribution information.
- Compile location data for migration stopovers and wintering grounds.
- Generate data for rangewide conservation strategies.
- Develop partnerships throughout the Americas.



We developed an Internet-based application called Priority Migrant eBird which uses eBird functionality to facilitate data entry and to produce data output products. The goals of the project are to collect distribution and abundance data for targeted species and to aid in identifying important stopovers or areas of concentration to help feed existing models and thus ultimately generate conservation strategies throughout their respective ranges. This technology can be managed by outside user groups to answer questions on both a regional and local level enabling organizations throughout the Americas to develop and use these tools for their own conservation needs.

Priority Migrant eBird

- Project in both English and Spanish.
- Pull down habitat menus, age and sex information, project specific protocols.
- Cornell coordinates recruitment effort, database development, website creation.
- Ownership and recruitment from partners in Latin American countries.

Bienvenidos a Priority Migrant eBird

(Donde tus observaciones hacen la diferencia)

Regístrate como nuevo usuario

Noticias sobre observación de aves

Introduciendo Aves Migratorias Prioritarias

Aves Migratorias Prioritarias selecciona datos de distribución y abundancia para cinco especies de aves que migran e invernan en Centro y Sur América. Datos detallados de las distribuciones no reproductivas son necesarios para generar efectivas estrategias de conservación de amplio rango para especies migratorias de larga distancia que han experimentado recientemente reducciones precipitadas de sus poblaciones. Únete a esta nueva y emocionante aventura e ingresa tus observaciones de Remita Cercada, Remita Alborada, Remita Alcazú y Remita de Capadú, así como del Ibis Bonaparte.

¡¡¡¡¡¡ Regístrate de Hábitat y Elevación

Además de ubicar en un mapa la localidad de una especie focal a través de América, ingresar datos del elevación y hábitat ayuda a identificar áreas para investigación, adquisición y conservación a futuro. Para más información selección el enlace.

Inicio | Acerca de nosotros | Envía Tus Observaciones | Ver y Editar tus Datos | ME AYUDAS

¡¡¡¡¡¡ Regístrate Edad y Sexo

Aviemos a seguir datos de la edad y sexo de los individuos de las especies un conocimiento futuro de invernada. Para mayor información visita el enlace.

Si usted tiene preguntas o desea unirse al proceso de ingreso de datos, sea bienvenido.

Registar

Paso 2: Fecha, Especie y Hábitat

TIPO DE OBSERVACIÓN

FECHA DE OBSERVACIÓN

HORA DE INICIO

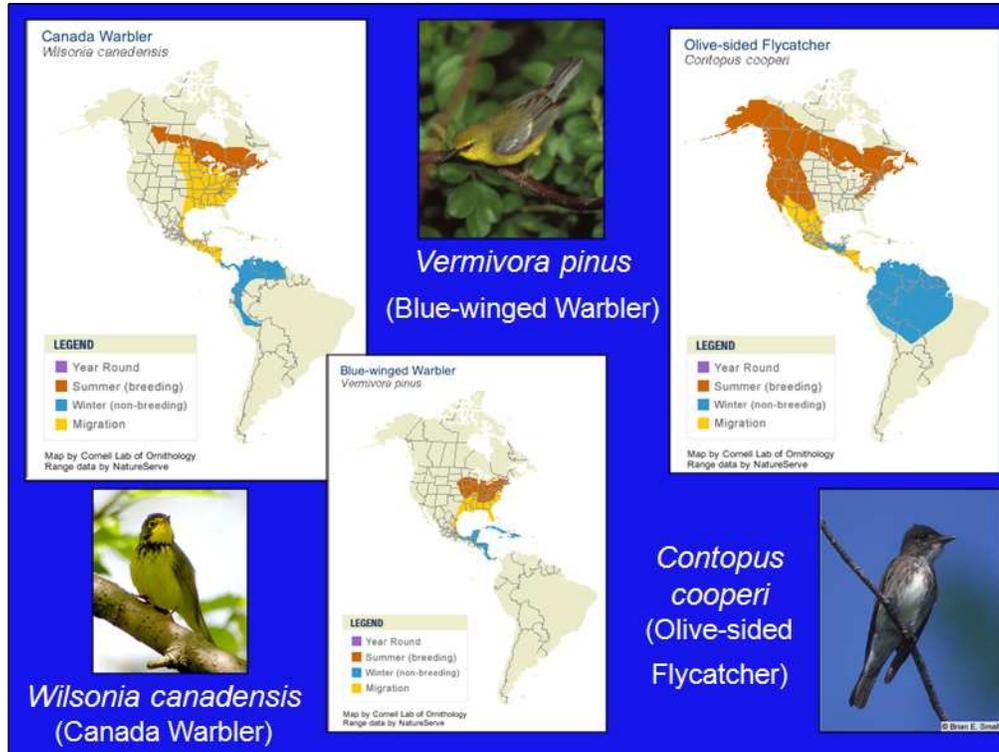
DURACIÓN

PRINCIPAL TIPO DE HÁBITAT

MODIFICADOR ECOLÓGICO

NÚMERO DE PERSONAS QUE SALIERON A OBSERVAR AVES

The project is supported in both English and Spanish as an effort to bridge the gap between wintering and breeding ground research. It includes a set of two pull down habitat menus. The first menu is major habitat type based on World Wildlife Fund's biomes and ecoregions. The second is an Ecological Modifier which describes successional and disturbance history often as a result of human activity. These serve to modify the major habitat types. A user can record the age and sex of individual birds seen and has the ability to add specific protocols to the list of standard eBird protocols on the data entry page. Data collected using specific protocols can be flagged in the database and pulled out for separate analysis. Cornell coordinates the program alongside eBird, yet it's a collaborative, working partnership with many different user groups on the wintering grounds.



We decided not to limit the program to just the Cerulean and Golden-wing so we choose 3 additional species that are high priority neotropical migrants with winter ranges largely in South America. These are the Canada and Blue-winged Warbler as well as the Olive-sided Flycatcher.



Since we developed the priority migrant application there have been rapid advances in the larger ebird program which is now available throughout the western hemisphere with collaboration in countries such as Colombia, Costa Rica, Ecuador, and Chile just to name a few. Anyone can record observational data on all bird species, including wintering migrants. Ebird records all the same information including elevation and age and sex data, except for habitat variables which, as I mentioned, we specifically built into the priority migrant application to pilot test these new data fields. We are still working on how to combine all this information on the back end so the data entered through these applications will be readily available through one easily accessed portal such as the Avian Knowledge Network's data download and database query tool, rather than by individual projects. A key point here is that all the ebird and priority migrant observation data go into the same database and now any user can bulk upload large datasets directly into this one database or download data from any number of participating projects at once by using a customized data query tool.

Status of Historic Databases

- Maria Isabel Moreno/Mariammar Gutierrez – 586 GWWA records (638 birds)
 - David Pashley (historical specimens)
 - Request from Central and South America through newsletters and media
 - ProAves, DataAves, Colombia National Census (2001-2005), Biomap (all for Colombia)
 - Some additional records from Costa Rica, Nicaragua and Colombia
- Maria Isabel Moreno – 453 CERW records (573 birds)
 - Biomap, DataAves, Grupo Ceruleo, ProAves, Ecoan, Jocotoco, Fundación Andígena
 - Request from Central and South America by Alianza Alas Doradas
- Melinda Welton – 145 CERW (145), 61 GWWA records (80)
 - Cerulean Warbler Migration Stopover Project 2004 - 2007
- Carrol Henderson – 49 GWWA records from Costa Rica (49)
 - Henderson birding tours from 1987 through 2008
- Priority Migrant data – 228 CERW (300), 39 GWWA records (53)
- eBird data – 885 CERW (1,306), 352 GWWA records (429)

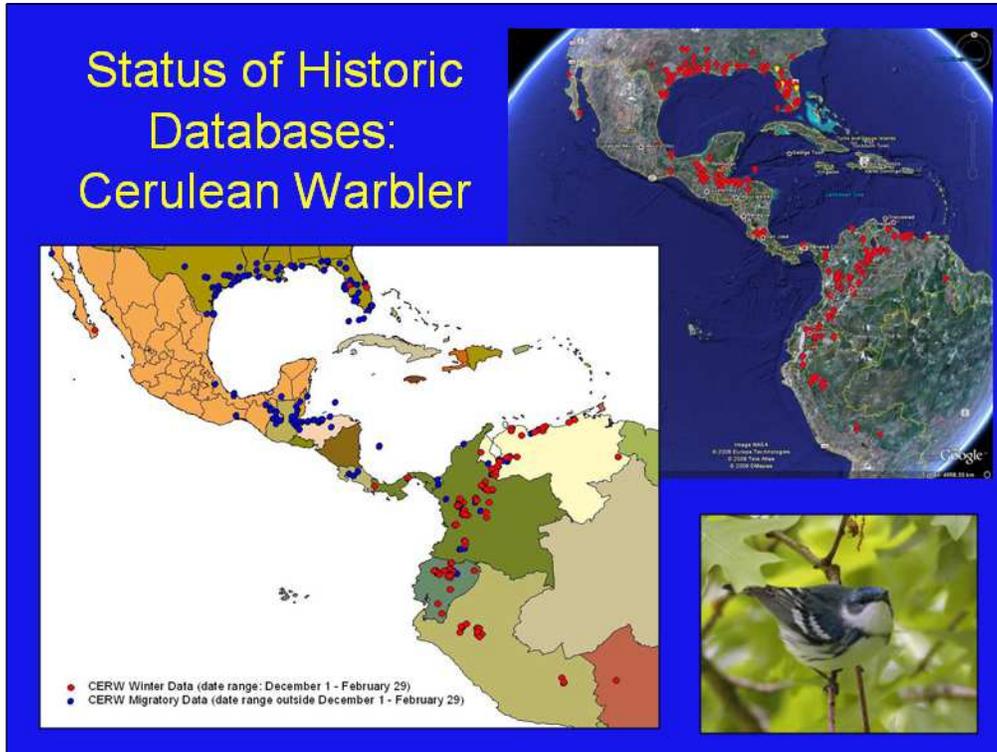


TOTAL = 2,324 CERW and 1,249 GWWA from non-breeding season

This is a summary of all the records and major sources of data that we've accumulated in this database at present. Currently there are georeferenced records of 2,324 Ceruleans and 1,249 golden-wings from the nonbreeding season. Maria Isabel Moreno and Mariamar Gutierrez helped to collect and clean up a large number of records for both species. These came from a request for data via ornithological newsletters and media outlets plus different data sets from groups such as Fundación ProAves in Colombia, the Andean Ecosystem Association in Peru, Fundación Jocotoco in Ecuador, Fundación Andígena in Venezuela, and El Grupo Ceruleo partners. Melinda Welton graciously provided us with data from her Cerulean Warbler Migration Stopover Project that took place in Belize, Guatemala, Honduras, and Mexico.

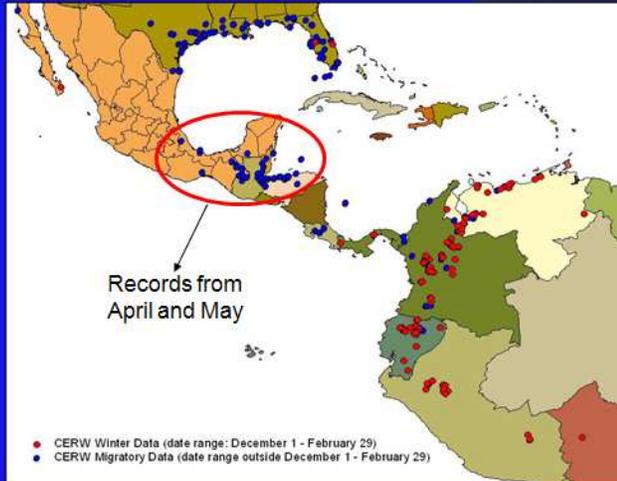
The data from Carrol Henderson was collected during 23 birding tours and was easily bulk uploaded into the application. This is a great example of the kind of datasets that we hope to acquire from Tour leaders who would be willing to share and upload their data into this centralized system as this is such an important data resource that currently remains mostly inaccessible. The priority migrant and eBird records at the bottom of the slide are especially exciting as this represents data that are just starting to be submitted from individuals who have discovered the program online without our help.

Status of Historic Databases: Cerulean Warbler



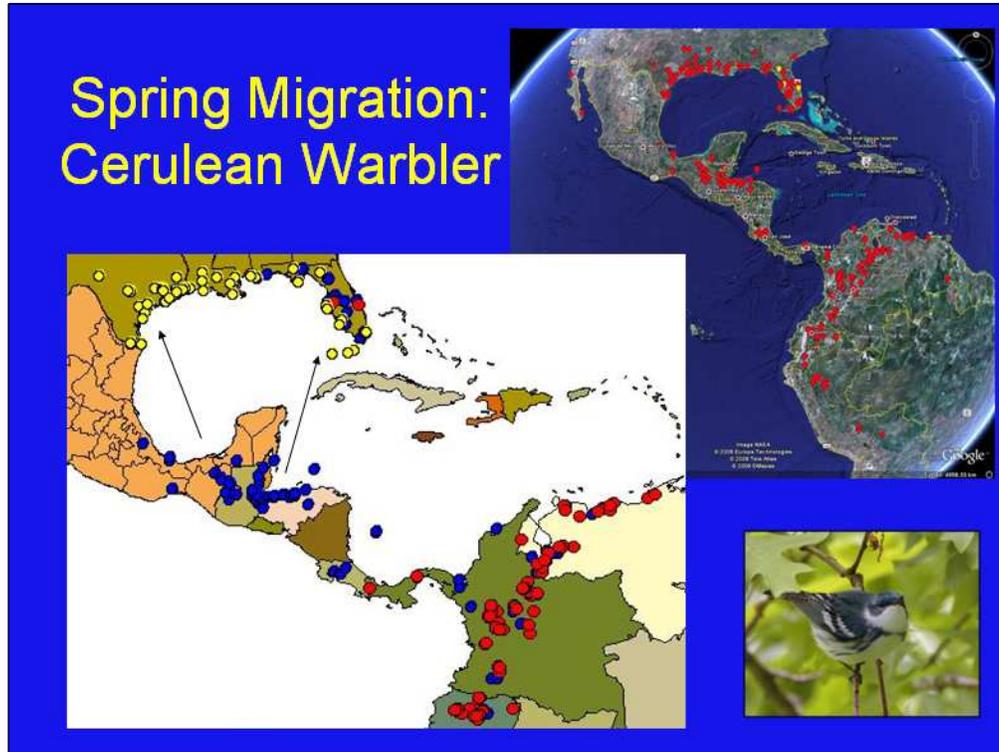
Here I've mapped all the records that we have to date for ceruleans from the non-breeding period. To create the image on the upper right I downloaded the data that I just described from the Avian Knowledge Network, directly to Google Earth to create this map instantly. The lower map displays the records in two periods, data from December through February shown in red representing birds on their true wintering grounds and records from the migratory period shown in blue. This clearly shows where the winter range is concentrated as well as some of the migration corridors, *extending from the Andes of South America, Central America and South coast of US.*

Spring Migration: Cerulean Warbler



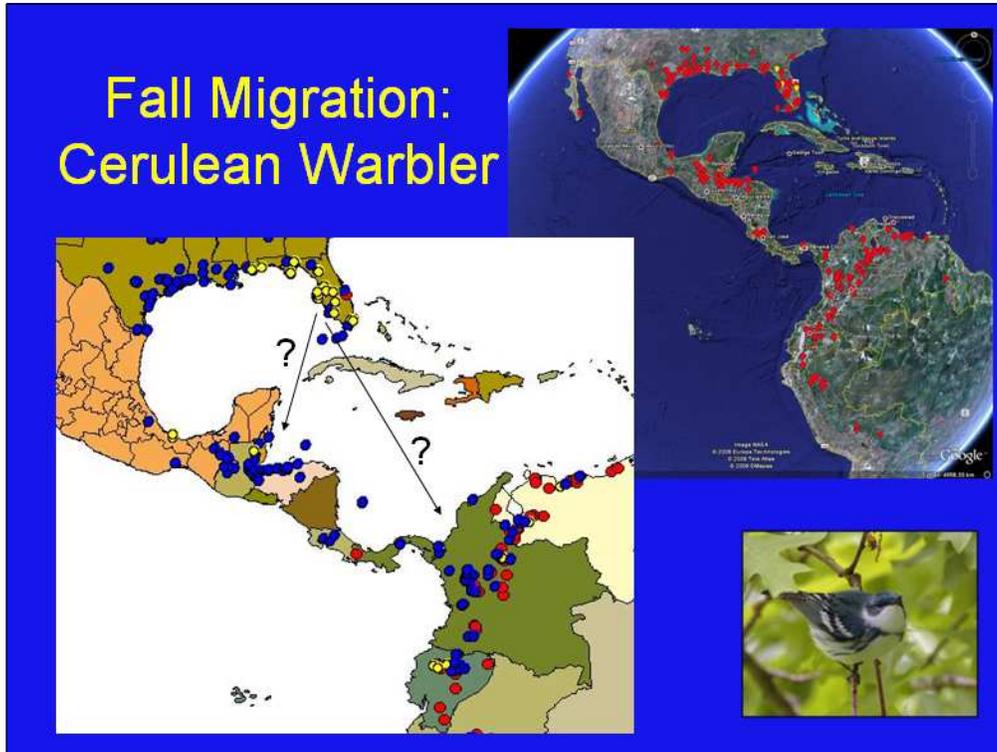
If we take a closer look we see the cluster of records in Central America are all from April and May. This is the migration route that Melinda Welton has been studying and will talk about in more detail shortly.

Spring Migration: Cerulean Warbler



But what happens after the birds leave Central America? These birds cross the Gulf of Mexico and make landfall on the Gulf coast of the United States. We see a pattern of records along the entire Gulf coast of the US from South Texas around to the Florida keys. These records shown in yellow are all from the month of April.

Fall Migration: Cerulean Warbler



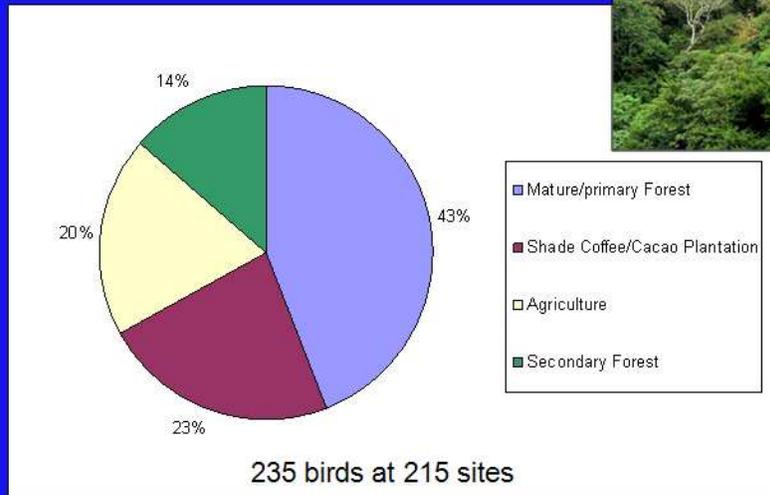
The fall migration of the cerulean is even more poorly known. What we're starting to see, though, is a pattern of fall records shown in yellow all for August and September, down the West coast of the Florida peninsula and a scattering of records on the Central American coast and within the South American wintering range. We know that they have arrived as early as July 31 in Colombia. What we don't know is how they get there in the fall. Do they jump from Florida and use the same areas in Central America that they use in the spring or do many birds fly nonstop from Florida to the South American coast.

Status of Historic Databases: Golden-winged Warbler



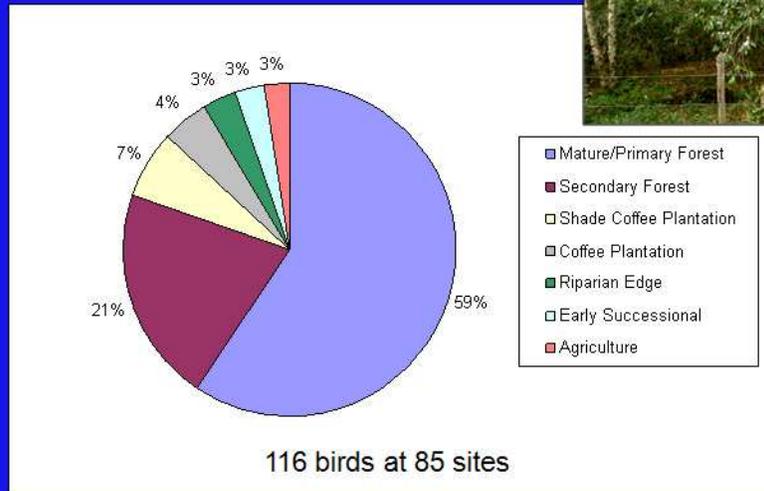
For the Golden-winged Warbler these maps show the winter distribution extending from the Colombian and Venezuelan Andes up through Central America to Chiapas in Mexico. We're just beginning to look at migration paths for golden-wings and this map nicely shows migration records extending up through Mexico and then along the gulf coast, *similar to the cerulean, but we have not yet looked at it in greater detail.*

Wintering Ground Habitat use by Cerulean Warbler



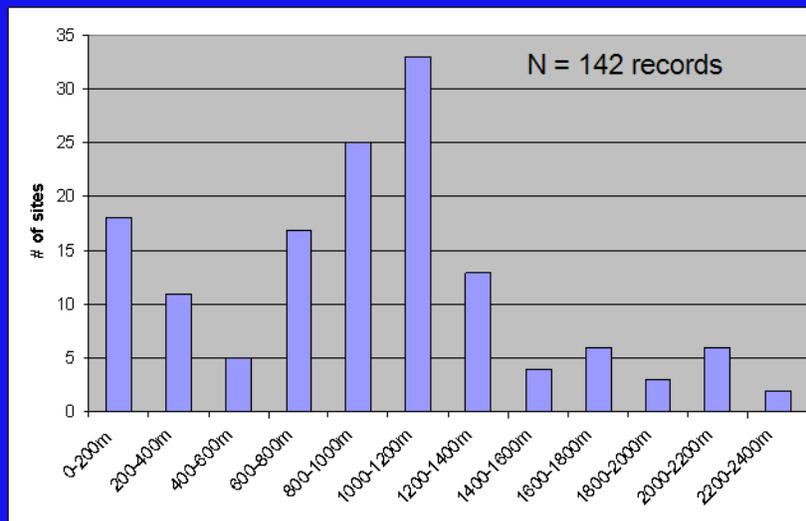
This is the breakdown of habitat use by Cerulean Warblers based on a subset of Priority Migrant records that included information from pull down menus of habitat types characterized from observational data. 43% of the birds were found in Primary forest with about 20% in both shade coffee and cacao plantations as well as agriculture which likely represents pasture and other tree plantations. Only 14% were recorded in secondary forest.

Wintering Ground Habitat use by Golden-winged Warbler



59% of the golden-wings were recorded in primarily mature forest while 21% were in secondary. For this subsample only a small number are listed in coffee and cocoa so far. This is just a first look based on the habitats that were entered and doesn't represent a systematic habitat study by any means, but as more data goes into the system the more accurate it will become and thus we hope to build upon this basic habitat data in the future.

Elevational Range of Golden-wing Records



Migration period, 77% of GWWAs = <800m

Winter months (Dec – Feb), 68% of GWWAs = >800m

Some of the records included elevation which seems to show a slightly bimodal distribution even though its over a fairly narrow elevation range with a definite peak in the 800-1200m category. Interestingly if you break out the mid-winter period from other periods 77% of the records from migration were below 800m whereas in mid-winter more than 2/3 of the records where above 800m. Most of the low elevation records were probably migrants.

Next Steps for Priority Migrant and eBird Datasets

- 1) Tracking the migration of priority species.
- 2) Centralized database with real time outputs.
- 3) Help target specific areas for further studies.
- 4) Identify most important areas for protection and conservation action in Latin America.
- 5) Develop species specific protocols for monitoring CERW and GWWA – training course at San Vicente.



We hope that as these data accumulate they become a more and more powerful resource that can help us generate the kind of maps and other outputs that I just presented, showing the extent of known data and how it's shaping the non-breeding ranges of these species. Now all observational data can go directly into ebird. Specific surveys that record habitat can still go into the priority migrant application and as we develop more sophisticated protocols for monitoring these datasets can all be combined through the Avian Knowledge Network into a single centralized database. Then it can be fed into the modeling and research efforts and perhaps more importantly we'll have a detailed baseline for identifying the most important areas for conservation action. These distributional datasets are really just the beginning, a work in progress that's rapidly evolving and readily available to the entire bird conservation community. The next steps are to develop species specific monitoring protocols on the wintering grounds which as I mentioned earlier will be the focus of the training course at San Vicente starting next week. *In particular they will take a closer look at the Cerulean Warbler protocol that Melinda has been using in Central America and a protocol for surveying GWWAs that Richard Chandler has been using in Costa Rica. Both will be speaking later in this session.*

Vision for the Future

We hope our colleagues will use this and future eBird applications to track and monitor all migrant and resident birds throughout the western hemisphere.

We invite you all to submit your observations!

www.ebird.org/primig or www.ebird.org



To download data visit:
www.avianknowledge.net



Thank you to all who have gone out of their way to submit large data sets to Priority Migrant eBird or helped prepare them:

Maria Isabel Moreno, El Grupo Ceruleo/Alianza Alas Doradas
Mariamar Gutierrez, El Grupo Ceruleo/Alianza Alas Doradas
Melinda Welton, Cerulean Warbler Migration Stopover Project
Carrol Henderson, Paul Hamel, Tom Will
Cornell Lab of Ornithology eBird Team



el Grupo Cerúleo

A Subcommittee of the Cerulean Warbler Technical Group



We invite you all to visit these eBird websites and submit your observations and would like to thank everyone who has helped to build these applications and gather these data.