



James R. Hill, III

The *PMCA's* Scout-arrival Study

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Just like some obsessed stamp collector, I have been collecting Purple Martin scout-arrival dates for the past twenty years — first as an independent Purple Martin researcher, then as director of the *Purple Martin Conservation Association's* ongoing Scout-arrival Study. The collection now contains over 40,000 annual dates of first observation for the Purple Martin from more than 5950 different communities. These dates are from three centuries, span 223 years from 1778 through the year 2000, and come from 49 United States, 11 Canadian Provinces, the country of Mexico, and several Caribbean Islands. Thanks to the help of *PMCA* volunteer, Dorothy Hecker (who over the past 12 years copied all of these dates, locations, and observer names into eight fat notebooks), and next, *PMCA* research assistant, Ken Kostka (who transferred the eight notebooks of handwritten information to a computer), we now have a specially-designed, computerized FileMakerPro database holding this unique and valuable information. The photo above shows one of these 40,000 computerized scout records from

the *PMCA's* database. As you can see, this particular Purple Martin scout record is from an observation made on February 4, 1821, in New Orleans, Louisiana, by John James Audubon, the father of North American Ornithology. But Audubon's scout report is not the oldest Purple Martin record we have in our database. The oldest date we currently have is from 1778, an April 23rd report from Newport, Rhode Island, reported by a Mr. Howe. If anyone knows of an older scout report for the Purple Martin published somewhere, please let us know. We'd like to add it to the database.

What is a Purple Martin Scout?

Purple Martin "Scout": The term given to the very first martin(s) observed back at an active colony site each year. Scouts are the oldest individuals in the population who migrate north as early as weather allows in an effort to claim the best nest cavities. Scouts, or First-Arrivals, can be either male or

female. These first birds will stay at your site if they nested there successfully the previous year, but will move on if they are migrants, resting briefly while traveling back to their former breeding sites. People once thought that martin scouts flew north in search of suitable breeding sites and then returned south to guide their colonies back to the sites they had selected. This is not true; a martin 'colony' is a random aggregation of unrelated birds attracted to a common breeding site. Colony members do not travel in, or function as, a flock. They arrive in spring, and depart in late summer, independently of each other.

First-arrival, or Scout-arrival, Date: The date the very first martin is observed at a nesting site where martins nested successfully the previous year. First-arrival dates are weather dependent and can vary by 2 to 4 weeks from one year to the next. Martin migration is a prolonged process, with successive waves of migrants arriving for 12 to 16 weeks after the first arrivals have returned.

How the Scout-arrival Database Is Designed

To manage a dataset containing this many records and to serve our particular research needs, we designed a simple database using FileMakerPro software (see photo on previous page). To enter a new observation into the PMCA's scout-arrival database, the computer operator clicks the "New Record" button at the top of the screen. This brings a new, empty record into view. The operator then types the state or province abbreviation into the "State/Province" field and tabs to the "Town/Location" field. This brings up a drop menu of all the towns or cities in that state where martin scout dates have been reported to us in the past, and the operator clicks on the appropriate location. Instantaneously, the computer goes to a lookup file and fills the "Latitude North," "Longitude West," and "10-Minute Block" fields with the appropriate geographic coordinate data for that exact location. We created this lookup file using DeLorme's Street Atlas software for each of the 5900 towns or cities we have scout dates for. In

Street Atlas, the operator types in the city and state, or zip code, and the software brings up a detailed map of that geographic area. The operator places the cursor on the location and the computer lists the detailed latitude and longitude readings for that community. We then type that information into the special lookup file for future use.



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Two adult female Purple Martin "scouts" perched on the empty pole that held their wooden martin house the previous season, waiting for their landlord to put up their house. Purple Martins exhibit strong site-fidelity and will return to the exact location where they bred successfully the previous year. The first birds back can be either sex, but are usually males.

Next, the operator types in the observer's name in the "Observer" field and tabs to the "Source" field where a drop menu presents a list of choices for the origin of the data (e.g., Scientific Literature, Biological Survey, PMCA, etc.). Next, the operator types the date into the "Date" field and hits the tab key. This keystroke automatically fills the "Day of the Year" field (taking into consideration whether or not it was a leap year) and the "Year" field.

The final step is to click the button for the appropriate age of the scout in the "Age of Bird" field. That concludes all the steps involved in filling out a single scout report from a single observer for a single location for a single year. It takes less than a minute to enter a new record in the database if the town/location is already in the lookup file. If not, a new record takes about three minutes to enter.

In this particular database, we only record the earliest scout report for any given community for any given year. All scout reports with later dates for a given location for that particular year are archived elsewhere in paper form.

What the Database Can Do

Having all this information in a computerized database allows us to do detailed searches and sorts on any field, or set of fields. For example, we can ask the computer to search for all the records we have from Vicksburg, MI (we have 64 years worth), or Dallas, TX (we have 42 years worth), and then ask it to calculate the average arrival date for that location. For Dallas, TX, the average arrival date is February 15th, for Vicksburg, MI, it's April 10th during non-leap-years, April 9th during leap years. We can also ask it to list all the different communities where

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martins were first observed in 1999 on March 16th (31 sites in 11 different states). Or we can ask it how many different locations, historically, have had martins return on January 1st (17 records from 11 different sites, all in southern Florida, during 11 different years: 1930, 1973, 1974, 1976, 1977, 1978, 1983, 1991, 1995, 1996, 1999). I'm sure there were other January 1st arrival dates, but these are the only ones we have records for in our database.

What Can We Learn From the Database?

Ultimately, we plan to generate the most detailed migration-timing maps ever produced for the Purple Martin, complete with day-by-day isochronal lines. Isochronal lines connect locations where martins, on average, arrive on the same day. These maps will have a January 1st line, a January 2nd line, etc., all the way up through a May 15th line. These maps will show us the most detailed picture ever produced of how martins advance across the North American continent on their journey northward. Annual difference can be correlated with weather variables. By superimposing these maps on elevation maps, we hope to learn what effect elevation has on martin migration timing, or learn whether the major river systems have earlier average arrival dates than nearby inland locations.

We can also generate maps for subadult Purple Martins whose arrival patterns are still somewhat of a mystery. We do know that in the northern half of the continent subadults begin arriving about 4 weeks after the adult martins do, but in the southern states data seem to suggest that their arrival could lag behind that of the adults by as much as 8-10 weeks. The reason the timing of subadult arrival is still such a mystery is that it's difficult to get reliable information from landlords since so many of them have difficulty distinguishing among the four breeding plumages of Purple Martins. Proper identification requires a longtime familiarity with martins, plus a spotting scope or high-quality binoculars. At established sites, it's a lot easier for landlords to report the date they observe their very first martin of the season than it is for them to detect the arrival date of their first subadult male who typically arrives after 10-100 adults are already back at the breeding site and blends in inconspicuously. For all these reasons, it's difficult for us to assess the reliability of the subadult martin sightings we receive unless we know the cooperator personally and know how vigilantly and frequently they search for arriving subadult males each day.

Global Warming?

One of the most intriguing things we hope to discover from analysis of this database is what effect, if any, human-induced global warming this past century has had on the long-term, average arrival dates of Purple Martins. We think it will show that martins are indeed arriving earlier. According to the United Kingdom Meteorological Office, the average temperature of the earth has increased 1.5 degrees F. over the past 100 years. Since Purple Martins are obligate aerial insectivores, their northward advance is strongly dependent on the emergence of flying insects. Insects, being cold-blooded organisms, time their emergence based on temperature thresholds. Other studies have shown that North temperate birds are laying their eggs earlier now than they did a century ago as a direct result of climatic warming of the earth.

How You Can Participate in the Scout-arrival Study

Everyone is encouraged to participate in this ongoing study by sending us your scout dates. We will add your dates to the computerized database shown above. We will also add it to our web

site so others can track the northward migration of the martin from their home computers each evening. You can phone, e-mail, fax, or mail us your scout date for the year 2000. If you have written records for other years and have never sent them to us in the past, please do so at any time. You can also submit your scout dates using the report form on our web site. To track the daily northward migration of the Purple Martin in 2000, visit our web site at <www.purplemartin.org/scout.html>.

Why We Need Your Continued Cooperation

This project is ongoing. In the year 2000, we would like to receive scout dates from 2000 different communities, which would be an all-time high for this study. If you've never participated, or if you've participated in the past, but not recently, we hope you will participate this year. We also want experienced landlords to be on the daily lookout for the arrival of subadult males and to let us know what they encounter.

Why should you participate? Because through the combined efforts of citizen scientists, such as yourself, we can add to our knowledge base on martins. Remember, we can only protect what we know, and by adding to our knowledge, participating landlords can help ensure the long-term survival of the birds they love.

FROM: _____ **Staple Here**

Place Stamp Here

**TO: Purple Martin Conservation Association
Edinboro University of PA
Edinboro, PA 16444**

Reply Card fold here

Scout Reply Card Directions:

- Put your housing up a week or two earlier than normal. If your housing is not up when the first martin returns, they may go unseen for days, or even weeks. Most of the entrance holes can be plugged to prevent occupancy by unwanted birds.
- Watch closely for the first martins. Gance at your martin housing several times a day, especially first thing every morning. Also, listen for their familiar vocalizations. If the weather in your area is unseasonably warm, the first martins could return 1-3 weeks early.
- Rap on the martin poles daily. Martins often return on an approaching low foot, but may remain hidden inside the housing while they wait out the bad weather. During foul weather, a good way to see if a martin has returned unseen is to thump on the poles.
- Phone, fax, or e-mail the PMCA when the first adult (ASY) martin is observed at your site. You can also submit an electronic report form at our web site: <www.purplemartin.org>. Be sure to follow the northward migration of martins by visiting our web site daily.
- Mail this card to us just as soon as you see your first subadult (SY) male. Thank!

Date first adult (ASY) martin was observed at your colony site this year: (SY date)

Date the first (ASY) martin was observed elsewhere in your community (If you are aware of an earlier date than yours): (SY date)

Date first subadult male (SY M) martin was observed at your colony site this year: (SY M date)

They arrive 3-4 weeks after adults; look daily with binoculars. Photo of SY M on front.

Location of your colony site. Example: "3 miles W of Eric, PA."

814-734-4420 (phone) • 814-734-5803 (fax) • pmca@edinboro.edu • www.purplemartin.org

Purple Martin Range & Migration-timing Map

This map shows the breeding range and arrival dates of the Purple Martin. The black lines mark the average first arrival dates of older, adult martins at established colony sites. Landlords with younger or smaller colonies will typically experience slightly later arrival dates. The map also shows the migration timing of subadult martins. The arrows indicate the average arrival dates of subadult martins. The map shows that subadult martins arrive from the south, typically from the Gulf of Mexico through Panama, and migrate northward across the continent. The map shows that subadult martins arrive from the south, typically from the Gulf of Mexico through Panama, and migrate northward across the continent. The map shows that subadult martins arrive from the south, typically from the Gulf of Mexico through Panama, and migrate northward across the continent.

The scout report card that the PMCA sends each year to its Scout-arrival Study cooperators. You can become a cooperator by reporting your scout date by mail, fax, phone, e-mail, or on our web-reporting page at: <www.purplemartin.org/scout.html>.