

# Project Martinwatch

*The world's largest team of backyard volunteers  
needs your participation!*

James R. Hill, III  
Purple Martin Conservation Association  
Edinboro University of PA  
Edinboro, PA 16444

Housing Type/ Cavity #	Date: Male/Female Age	Date First Egg is Laid	Earliest Poss. Fledge Date	15 May	20 May	25 May	30 May	4 June	9 June	14 June	19 June	24 June	29 June	4 July	9 July	14 July	19 July	24 July	Egg #	Hatch #	Fledge #
WH-1	A/A	5/18	7/03	PM N	3E	7E	7E	7E	4E 3Y	7Y NR	6Y	6Y NR	6Y	0Y	N	N	N	N	7	7	6
WH-2	S/A	6/03	7/16	ST ND	ST ND	HS ND	PM N	2E	4E	4E	4E	1E 3Y	1E 3Y	1E/3Y NR	1E 3Y	1E/3Y NR	1E 0Y	1E	4	3	3
WH-3	A/?	6/04	7/19	X	X	PM N	N	1E	6E	6E	6E	5E 1Y	5Y 1DY/D	5Y NR	5Y	0Y	N	N	6	6	0
WH-4	S/S	5/31	7/14	X	X	PM N	N	5E	5E	5E	2E 3Y	5Y	3Y/NR 2DY/D	3Y	3Y NR	2Y	0Y	N	5	5	3
WH-5	S/A	5/26-28	7/07-09	PM N	N	N	3E	3E	3E	1E 2Y	3Y	3Y NR	3Y	3Y NR	3Y	0Y	N	N	3	3	3
WH-6	S/S	6/07	7/20	X	X	X	PM N	N	3E	4E	4E	4E	3Y	3Y NR	3Y	3Y NR	0Y	N	4	3	0
PG-1	??	6/05-09 6/20-21	7/15-19 8/02-03	X	X	X	PM N	N	1E	0E	N	4E RA	4E	4E	4E	4E	4E	4E	1 4	0 0	0 0
NG-1	S/S	6/01	7/15	X	X	PM N	N	4E	5E	5E	5E	5Y	5Y NR	4Y 1DY/D	4Y NR	4Y	0Y	N	5	5	4
<b>Data Sheet Totals:</b>																			39	32	19

A completed Project Martinwatch nest data sheet from a hypothetical 6-unit wooden martin house that has one plastic and one natural gourd hung underneath it. A data sheet for your site is on the facing page, along with a key explaining the coding system. Project Martinwatch participants are asked to record the contents of each of their nest cavities, every 5 days, all season long.

**Your Help Needed:** Starting with the 1995 breeding season, the PMCA is asking martin landlords to participate in a continent-wide, scientific project, known as "Project Martinwatch." Participants will monitor their martin nests weekly, record the information on photocopies of the data sheet shown on the facing page, then send the data sheets to the PMCA at season's end. Project Martinwatch will allow us to obtain information on the range-wide reproductive success of martins, and on annual population trends (see below).

**Participation is Easy:** Just conduct nest checks on your martin housing every 5 days, all season long, and record the contents of each nesting cavity on a copy of the Project Martinwatch Nest Data Sheet, located on the facing page. There is space to record data from 24 nesting cavities. If you offer more than 24 cavities, please make additional copies of the blank form. We want

your data, regardless of the size or success of your site. If some of your martin housing is not accessible during the nesting season, just send us data from those compartments you can check.

Project Martinwatch participants should start monitoring nests when nest building begins at their sites, and continue checking every 5 days, all season long, until all the young have fledged. If you can't check nests every 5 days, then do it every 7. Do your checks at midday or late in the afternoon. Avoid checks during cool or rainy weather, and always work as quickly as possible to minimize the time parents are kept away from their eggs or young. If a period of bad weather threatens to disrupt your regular nest-checking schedule, just postpone the check for a few days, or do it a few days before the predicted storm. Adhering to a strict 5-day schedule is not absolutely mandatory, just strongly recommended.

Enter your data directly onto the data

sheet as you conduct each check. Landlords using individual nest record cards (available in the PMCA's 1995/96 Martin Market Place products catalog), can transfer information from the cards to this data form. Be sure to number all of your compartments. Landlords with telescoping poles should draw alignment tabs at each pipe joint to assure that active housing is correctly reoriented after each nest check lowering. For more on drawing alignment tabs, see the booklet, "Enjoying Purple Martins More."

Nest monitoring (including handling nestlings or eggs) will not cause martins to abandon their nests or colony sites; this is an "old wife's tale." In fact, landlords who conduct regular nest checks raise substantially more martins than landlords who don't. Conducting nest checks enables landlords to discover serious problems (e.g., parasites, nest-site competitors, predators, wet nests, chilled nestlings on bare floors, etc.) in time to remedy each of these potentially-lethal



Continued from page 10

situations. Weekly nest monitoring is the best way for landlords to boost the nesting success of their martins.

**Nest Check Codes:** The codes to use during your nest checks are listed in the box labeled "Martin Codes" on the data sheet. Please familiarize yourself with these codes and the layout of the entire data sheet. Notice that there is a place at the top of each data sheet for you to record the date of each nest check. Use a separate line to record the contents of each nest cavity. List the housing type and cavity number in the far left column. The second column is for the age of each parent (if known), listing the male first, female second. The third is for the date the first egg is laid, after you determine it through extrapolation. The fourth column is for entering the earliest possible fledging date for each nest (see below). The remaining columns are for entering the results of each nest check, and for recording any actions you may take. Notice that more than one code can be entered in a single box and that codes can be combined, as in 3Y/2DY/D, for "3 live young, 2 dead young, discarded." Or, as in 1E/3Y/NR, which means "1 egg, 3 young, nest replaced."

Nest replacement is an optional practice used by many landlords. When the young in each nest are about 10-days old (and again at about 20-days old) landlords remove the nest, and replace it with a 1-2" thick pad of fresh wood shavings, pine straw, or thoroughly-dried lawn clippings. A bowl is fashioned in its center before the young are placed back into the nest. This is the safest way to eliminate nest parasites, without the use of chemical pesticides, which may be harmful to the nestlings and parents. As in the sample nest data sheet, landlords should remove dead nestlings from their nests whenever they are encountered.

**Calculating Clutch-initiation Date:** Since martins lay just one egg a day, and never skip a day, it is easy to pinpoint the exact date (or range of dates) the first egg is laid. Referring to the sample chart: Nest WH-1 had 3 eggs on the 20th of May and 7 on the 25th. This means the first egg

was laid on the 18th of May. Nest WH-2 had 2 eggs on the 4th of June and 4 eggs on the 9th. This means the first egg was laid on 3rd of June. These two examples are straightforward. When martins lay 4 or fewer eggs, and nest checks are done at 5-day intervals, clutch-initiation dates

do your checks every 5 days, instead of every 7, especially during the critical egg-laying period, which is the entire first half of the nesting season.

**Counting Eggs and Nestlings:** Before their clutches are complete, Purple Martins commonly hide their eggs under a layer of green leaves. If landlords don't gently dig through this leaf layer with their fingertips (or a blunt probe) to look for these hidden clutches of eggs, they will miss their opportunity to calculate an accurate clutch-initiation date. After hatching, martin nestlings cuddle with each other in order to reduce heat loss. To count nestlings accurately, this mass of intertwined flesh must be separated with a finger or blunt probe. In houses or gourds with access doors, monitoring nests is simple, but in housing lacking these features, landlords may need ladders, flashlights, blunt probes, and small mirrors, in order to check nests. Adding porch dividers to all housing with shared porches will prevent older nestlings from walking between compartments and confusing your totals, not to mention causing higher nestling mortality.

**Martin Breeding Biology:** Purple Martins lay 1 egg a day until they've laid 1 to 7 eggs. They never skip a day. Incubation begins before the last egg is laid and requires 16 days (from the laying of the last egg until the hatching of the last egg). Once hatching begins, it may take 48 hours for

all the eggs in a clutch to hatch. Due to this staggered hatch, nestmates may vary in age by as much as 2 days, causing fledging of most nests to be spread over 2-3 calendar days. Nestling martins don't fledge until 26-30 days post hatch.

**Fledged or Failed?:** Using these parameters, landlords can determine the approximate ages of the young in each nest, and from that, their earliest possible fledging dates. A formula for determining it follows: *Earliest Possible Fledging Date = Date First Egg is Laid + [(Number of eggs laid, minus one) + 16 days + 24 days]*. For example: if a clutch of 5 eggs was initiated



James R. Hill, III

The most beneficial action a landlord can take to help increase the breeding success of the martins under their care is to conduct weekly nest checks. Here, Andy Troyer, and his son, Adam, conduct a 5-day nest check.

are sometimes harder to determine to the exact day. This can be seen in the three examples shown in nests WH-5 and PG-1, where a range of possible first egg dates had to be entered.

Determining the exact clutch-initiation date can get even more difficult when nest checks are only done every 7 days, instead of every 5 days. In such cases, clutches of 6 eggs or smaller will sometimes have to be entered as a range of potential dates, instead of as an exact date. The problem with this is that the earliest possible fledging date is then also a range of dates, making the exact outcome of nests more suspect. Because of this shortcoming, please try to

on June 1st, the last egg would be laid on the 5th. The last egg would hatch 16 days later on June 21st, and the *oldest* nestling shouldn't fledge until *at least* 24 days later, on July 15th, the day it would turn 26 days old (assuming it hatched 2 days earlier than the last hatched egg, which is common). Using the formula: June 1st + (5-1) + 16 + 24 = 44 days. When you add 44 days to June 1st, you get July 15th. Add 42 days to the clutch-initiation date of 3-egg clutches to get the earliest possible fledging date; 43 days to 4-egg clutches; 44 days to 5-egg clutches; 45 days to 6-egg clutches; and 46 days to 7-egg clutches. If any nestling disappears before it could possibly be 26 days old (i.e., its earliest possible fledging date), you should assume it did not fledge.

Use a calendar to calculate the earliest possible fledging date for each nest. For a 5-egg clutch initiated on June 1st, you would begin adding the 44 days as follows: Go to the calendar, find June 1st, place your finger on it, lift your finger and place it on June 2nd, count one. Next, lift your finger onto June 3rd and count two, etc. Continue until you have added 44 days, which would take you to July 15th, the earliest possible fledging date for a clutch of five eggs initiated on June 1st.

**Summarizing Your Data:** Fill in the three columns on the right-hand side of the data sheet as the season progresses. Once you have determined the clutch size for a nest, enter it in the Egg # column. Likewise, record the maximum number of young that hatched in each nest in the Hatch # column. If you don't wish to calculate earliest possible fledging date (and thus, fledging success), leave the Fledging # column blank — we will do the calculations once we receive your forms. To calculate season totals for each sheet, total all the numbers in each of these 3 columns, and record them in the circles at the bottom of each data sheet. If you allow other species of birds to nest in with your martins, do not include their totals in these summary columns, nor at the bottom of the sheets. Note that nest PG-1 has two entries in each of its three summarization columns, because two nesting attempts were made in this plastic gourd. A renesting attempt is defined as the laying of additional eggs after the first breeding attempt fails or is abandoned.

### Criteria For Assigning Parental

**Ages:** Purple Martins exhibit delayed-plumage maturation — they take two years to acquire their *adult* plumage, but breed as one-year-olds in a *subadult* plumage. They are also sexually dimorphic, meaning that males and females wear distinctively different plumages. As a result of these two phenomena, landlords will observe *four* distinct plumages at most colony sites. Landlords that are skilled at distinguishing these four breeding plumages of martins should record the age of each parent at each nest in the second column of the nest data sheet. If you are unsure of the age of a particular individual, just put a questionmark (“?”) in its sex/age category on the data form, or refer to the color photos in the booklet, “*Enjoying Purple Martins More,*” (available in the PMCA’s 1995/96 *Martin Market Place* products catalog), or see a copy of *Update* 3(4). Parent martins are best sexed and

**“Weekly nest monitoring is the best way for landlords to boost the nesting success of their martins.”**

aged with the aid of binoculars or spotting scopes. Every landlord should own a pair. Before assigning an age to an individual parent, they should be identified *entering* their cavity (with nest material, to incubate eggs, or to feed young), on at least three different dates. This is because bachelor males frequently sit in front of (and look in) every compartment and could be incorrectly assigned if only one observational period was used.

To help landlords who don't have immediate access to color photographs of martin plumages age their birds, we describe the differences: **Adult males** are entirely glossy purple-black (or steel-blue). **Subadult males** resemble females by being speckled gray on front, but have a sprinkling of at least one, but often many, solid-purple feathers in one or more of the following areas: their chins, throats, breasts, flanks, bellies, or undertail coverts (crissum). The number of purple feathers in these areas is highly variable. Subadult males also have a scattering of isolated purple feathering on their napes (hind necks), backs and rumps. All male martins are most easily distinguished from females by their unique song — only males sing the common song that ends with a rapidly-clicking, “krieeek” sound, which they deliver with a conspicuous, open beak. **Adult females** are dusky-gray on front, but

have far more purple on their crowns, napes, shoulders, backs, and rumps than subadult females, which tend to be far browner in these areas. In addition, adult females tend to have slightly (or greatly) darker breasts, bellies, and undertail coverts than do subadult females. **Subadult females** are browner on their crowns, napes, shoulders, backs, and rumps than adult females, and are sometimes lighter on their fronts. Their undertail coverts are usually pure white, or faintly dusky, with only the central quill of each feather slightly darker.

**What Can Be Learned From Project Martinwatch:** Every summer, thousands of landlords conduct weekly nest checks on their martins, recording the breeding success of the birds under their care. Unfortunately, this valuable information isn't collected in a standardized manner,

nor is it sent to a centralized location for detailed analysis and eventual publication. Now, with Project Martinwatch, widespread participation will enable the PMCA to obtain data about martins unavailable

through any other means and will help answer several important ornithological questions. For instance, we will be able to monitor annual population changes on a continental basis, measure regional and annual differences in reproductive success, and determine the variation in reproductive success (and timing) as affected by parental age. We will also be able to learn how latitude affects clutch size and the timing of breeding in martins, and can compare the relative reproductive success of martins using wooden houses, metal houses, plastic houses, natural gourds, and plastic gourds. Your cooperation with this ongoing project will help us all better understand Purple Martins, and enable us to devise martin housing and management practices best suited to their needs.

If you need additional Project Martinwatch nest data sheets, or have any questions about this project, please call the *Purple Martin Conservation Association* at 814-734-4420. Thanks for your help!