

Banding Purple Martins

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A subadult male Purple Martin banded on his right leg with a 9-digit U S Fish & Wildlife Service aluminum band, and with a red auxiliary marker on his left leg. This bird is "red #75 plastic left."

Introduction

Perhaps the most valuable tool in the conservationist's and ornithologist's investigative arsenal is the technique of bird banding, which is the placing of a permanent, lightweight band on the leg of a bird for the purpose of individually identifying them in the future. Nearly everything humans have learned about the migrations, movements, and longevity of birds has come from organized banding programs.

Because martin landlords are showing a growing interest in having their martins banded, we thought this article could help answer some of the questions we typically get asked here at the *Purple Martin Conservation Association* (How can I get my martins banded? Where do I get the bands? Etc.), as well as explain the hows and whys of bird banding today.

History of Bird Banding

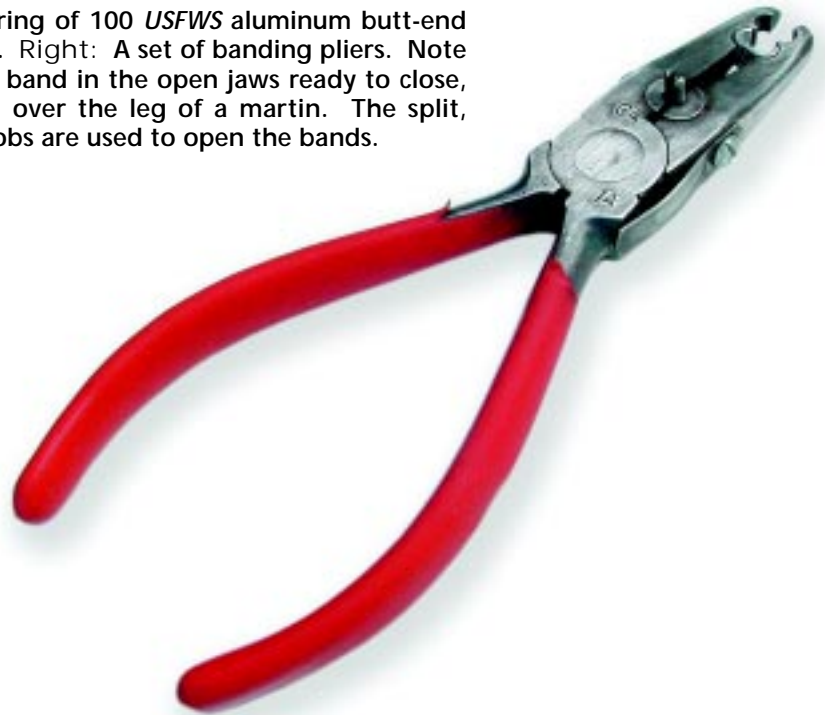
Humans have been banding birds for thousands of years, but the organized, scientific banding of birds didn't really begin until about 100 years ago, in Europe. It quickly spread to North America and in 1920, the U.S. government took responsibility for coordinating all banding within its borders. The government's *Bird Banding Laboratory (BBL)* in Laurel, Maryland is now under the auspices of the biological resources division of the *U.S. Geological Survey*. In close cooperation with the *Canadian Wildlife Service*, the *BBL* serves as the clearinghouse for all of the banding data collected in North America. Today, almost 6,000 banders across the United States and Canada work to solve the mysteries of bird biology, ecology, and migration.

Banding Permits

To legally band Purple Martins (or any species of bird), a person first needs to acquire a Federal Bird Banding Permit, and often a state permit as well. Any U.S. citizen, 18 years of age or older, can apply for a Master Bird Banding Permit from the *U.S. Fish & Wildlife Service (USFWS)*, but permits can be difficult to get. An applicant's reasons for wanting one must be compelling. On the application, the applicant must outline in detail the scientific project they are proposing to conduct that will require the use of bands. The *Bird Banding Lab* will not give permits to individual martin landlords wanting to band their martins for their own curiosity, to see how many come back. The proposed project must be professional, wide-ranging, and long-term enough to warrant publication in a peer-reviewed, scientific journal at the comple-



Left: A string of 100 USFWS aluminum butt-end bird bands. Right: A set of banding pliers. Note the spread band in the open jaws ready to close, harmlessly, over the leg of a martin. The split, vertical knobs are used to open the bands.



tion of the project, or to be presented as a paper at a professional ornithological or bird banding conference.

The information gathered using bands has to serve some conservation or educational purpose. It should be a project that has not been conducted many times in the past by other martin banders. This means an applicant needs to have some familiarity with the published scientific literature on the species with which they intend to work.

Applicants will maximize their chances of getting their own Master Banding Permits if they apply just to band Purple Martins, and only in their own home state. However, it's far easier to get a sub-permit under a Master bander, than to get your own Master permit (most Master Bird Banding Permit holders started off first as apprentices under other banders). The minimum age for a sub-permittee is 16 years of age. The trick is to find a local Master bander willing to let you apprentice under him or her as a sub-permittee for a season or two. Contact your local *Audubon Society*, university, or state game warden for help finding a licenced bander.

Because of these restrictions, most permits are issued to Federal and State Conservation agencies, the academic community, professional and amateur ornithologists, and nongovernmental organizations. According to the *BBL's* web site, these banders are involved in determining hunting regulations, monitoring bird populations, restoring endangered species, studying the effects of environmental contaminants, studying bird ecology and behavior, and addressing human health issues, public safety, and economic factors that involve birds.

Why Are the Requirements for a Banding Permit so Rigorous?

Banding permits are difficult to get because bands are a limited resource and banders must be trained before being allowed to capture and handle birds. For the accuracy and standardization of the data, banders also need to be highly

skilled at identifying birds in all plumages and be meticulous in their record keeping. Another limited resource is the staff and funding at the *BBL* required to process and coordinate all the banding data. Each year about 1.2 million birds are banded in North America. Over 60 million have been banded since the *BBL* was created.

What Equipment Does a Martin Bander Need?

Martin banders need to order size-appropriate, butt-end aluminum bands (see photo, above left) from the *Bird Banding Lab* in batches of 100 at least 6 months in advance of when they will be needed. Sometimes a high demand for bands depletes the *BBL's* supply, resulting in a long wait. Martin banders also need correctly-sized banding pliers (see photo, above right). Banding pliers serve two functions: one part of the pliers spreads the aluminum bands open so they will slip around the leg of the bird, and the other part closes the bands safely around the bird's leg. Correctly-applied bands do not injure or hinder the bird. Banders planning to tag adults as well as nestlings will also need holding bags, a notebook in which to record data, and (optionally) wing and tail rulers, a digital scale, and digital calipers (most banders measure the weight, wing chord, tail length, and tarsus length of the adult birds they capture. Some banders also measure the degree of feather molt and the amount of body fat.)

Auxiliary Marking Permits

A banding permit allows a bander to capture and band certain species of birds with aluminum *U.S. Fish & Wildlife Service* bands. This is a useful tool if you are only interested in a few basic facts about the birds you band. Banded birds are individually marked for identification, but only when they are in the hand can the band number typically be read. Most birds banded this way are only recovered when found dead. This can be very limiting depending on what type of study

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you are conducting. If you are interested in behavior, site-fidelity, mate fidelity, etc., you also will want to mark your birds with numbered color bands that can easily be read from a long distance with a good spotting scope. To legally color band, a bander is required to obtain an additional permit, an auxiliary marking permit, which authorizes the bander to use color bands in addition to aluminum U.S. Fish & Wildlife Service bands. Bander using color bands must coordinate with the BBL to assure that the color(s) and alphanumeric sequences they desire will not duplicate any other researcher in North America banding that species of bird.

The best plastic color bands (shown on pages 2, 4, and 5) come from a company in England, can take 6 months to receive, and are about 25 cents apiece. Colored, anodized aluminum auxiliary bands (shown on page 6) are available domestically for about 15 cents apiece. Whichever kind of color band is used, martin banders should coordinate the USFWS bands and the color bands, so that the last 2-3 digits of both bands placed on each bird agree. Scoping the color band from a distance allows the bander to know what the U.S. Fish & Wildlife Service band number is.

Marking martins with color bands is of little future use unless you also own a high-quality spotting scope and tripod (see photo on page 6) to read the bands after the birds fledge and return in coming years. Plus you must be willing to commit a lot of time in the years that follow, looking for returning color-banded birds. Here at the PMCA, we devote about 300 hours each year looking for color bands with spotting scopes locally and in the tri-state area.

At the end of each field season, banders are required to submit their detailed banding records in a timely manner to the BBL for computer processing. All of this reporting used to be done by hand, on paper. Now the BBL and the banders it coordinates are transitioning to an entirely digital reporting method, using a computer program called "Band Manager."



Some of the plastic leg bands used by the PMCA as auxiliary markers. Note that the white band has an alphanumeric (both letters and numbers).

How Do Martin Bander Capture the Birds?

Most martin banders just band nestlings. They band them when the birds are between 12 and 20 days of age. It helps greatly if they are in accessible housing. Nestlings younger than 9 days of age have legs that are too short and fat to accommodate martin bands without pinching. Nestlings older than 24 days of age will protest loudly and will be difficult to keep in the nest cavity once returned, unless the holes are plugged with stringed cups for about 10 minutes at the finish of banding.

One martin bander I know uses mist nets to capture his adult martins. Mist nets are specially-designed bird nets that come in a variety of lengths, colors, and mesh sizes. They trap a bird when it flies into the wall of netting and then falls into a pocket, slightly entangling itself. This bander strings his nets quietly at night about 10-20 feet in front of the housing and captures many adults as they leave their nests first thing in the morning.

At the PMCA, we capture adult martins for banding one at a time in their nest cavities as part of our ongoing diet study. We use the "fishing for martins" technique of rigging an external shutter over the entrance hole, held up with a cotter pin. Fishing line is attached to this pin and the pin is then pulled out from about 100 feet away when a martin enters the cavity. The human trapper, holding a fishing pole, and watching through a spotting scope, tugs on the line just as soon as an adult enters the active cavity with food (see Update 4(4):10-11). Gravity causes the shutter to fall.

Other ornithologists have designed special trapping houses, or traps for commercial houses, that imprison



A nestling Purple Martin banded on its left leg with a 4-digit yellow auxiliary marker. This bird is "yellow #1708 plastic left."

all the adults at night, simultaneously, by pulling on a trigger string that closes off all the entrances of a martin house.

Regardless of whether martin banders band nestlings or adults, they should always work quickly so as to minimize disturbance to the colony site. Never band during extreme weather (hot or cold) as this will further stress the birds. Handling the nestlings (or the adults) will not cause abandonment of the site or the young. Because of the 30+ day stagger in hatching dates (and thus, age of nestlings) at most medium-to-large colony sites, it can take 4-5 consecutive weekly visits to each site in order to get every martin nestling banded.

How to Report a Banded Purple Martin

As a martin landlord, it is a good idea to get into the habit of checking the legs of any dead Purple Martins you may find; the birds could be banded. Also, if you own a spotting scope, look over the legs of your martins weekly, and continue doing so even late into the breeding season when fledglings are on the move; you may just see a color band. Actually, the odds of finding a banded martin are not that remote these days. Since 20,000 or more martins are being banded in the United States and Canada annually, there could theoretically be 30,000+ martins alive at any given moment carrying a band. When you find a band, record the 8 or 9-digit aluminum number, the geographic location, the date of the encounter, plus the age and sex of the bird. If you scope a live martin with an auxiliary marker, report the color, the one- to four-character alphanumeric code, which leg of the bird is color-banded, and whether the color band is plastic or metal. For reporting the information, you will receive a "Certificate of Appreciation" for cooperating with the North American Bird Banding Program (see photo on page 7). Communicate your information to the *BBL*:

Bird Banding Laboratory
Patuxent Wildlife Research Center
U S Geological Survey
12100 Beech Forest Rd Ste 4037
Laurel, MD 20708
1-800-327-BAND (2263)
www.pwrc.usgs.gov/bbl/



Plastic auxiliary markers come in sequential strings of 100. The aluminum spatulas are used to spread open the bands for placement on the bird's leg. Color bands should be placed right-side-up so they can be read correctly when the bird perches. These bands can be read at distances of up to 250 feet with a spotting scope.

Illegal Banding

Every year, a handful of landlords capture and band their martins illegally, without possessing the proper permits, and (obviously) without using *U.S. Fish & Wildlife Service* aluminum bands. Some don't know it's illegal and potentially harmful to do so. Others either don't care, or are so anxious to have their birds banded, they go ahead and band them anyway. They use homemade bands, or cage bird bands, that often are not sized properly for martins. Improperly-sized bands can chafe and maim a bird's leg, rendering it lame and doomed in the wild. Such banders also deprive the finder of the band any way of learning the history of the bird, and deprive themselves of any possible knowledge that their banded bird was recovered by someone, somewhere, at some point in time.

There are extremely stiff fines for capturing and banding Purple Martins without the proper permits.

What Do We Already Know From Banding Purple Martins?

According to the *BBL*'s web site, 150,175 Purple Martins have been banded during the 45 years spanning 1955-2000. The *BBL* has only received encounter reports from 1,345 of these bands. This is less than 1/10th of one percent, or less than one bird for every 1000 martins banded! This seems very low, but it's because the *BBL* doesn't want banders to report "returns." The above figures are from "recoveries." A "return" is very common and is the resighting of a bird, by the bander of that bird, within the same 10-minute (latitudinal and longitudinal) block it was originally banded in. True "recoveries" of a bird are sightings outside

of the 10-minute block it was banded in, usually (but not always) by someone other than the bander. While there have been relatively few recoveries of banded Purple Martins, I would estimate there have been over 25,000 returns. It is from these returns and recoveries that the *PMCA* has learned the following things about martins:

Site Fidelity: Adult and subadult breeders have strong site-fidelity and about half of them will return to their previous colony site the following season. The other half presumably died or breed elsewhere.

Site Abandonment: A breeding Purple Martin will usually (but not always) abandon its colony site from one year

to the next if it suffers reproductive failure. A small percentage of martins do not abandon their sites even after having an unsuccessful breeding season. In contrast, banding by the *PMCA* has shown that a few martins switch colony sites from one year to the next despite reproductive success at the other site.

Cavity Fidelity:

Some martins return and breed in the very same cavity as they did the previous breeding season. Others return and nest in the same house or gourd cluster (but in a different cavity), or the next nearest house or gourd cluster.

Mate Fidelity: Mate fidelity is low in the Purple Martin. The vast majority of martins have a different mate each breeding season, even if the old mate is present again the following season.

Cavity-type Imprinting: Martins do not imprint on the type of housing from which they were fledged. A nestling fledged from a wooden house is just as likely to breed the following year in a natural gourd, a plastic gourd, or in a metal house if all types are available to it.

Natal-site Fidelity: Of every 100 nestling martins banded, anywhere from no subadults to 13 subadults will return to their natal sites the



A string of violet, anodized aluminum auxiliary markers for Purple Martins. This string (A400-A499) and others like it were used in New Jersey during the 2002 breeding season by banders, Allen Jackson and Tim Shaheen.

following year. Small colonies tend to get a lower percentage back. Larger colonies, and sites that add additional housing each year, tend to get higher percentages back.

Dispersal: The vast majority of surviving 1-year-old (subadult) martins breed at sites within 30 miles of their natal site. Females disperse farther from their natal sites than males. A few disperse hundreds of miles away.

First-year mortality: During the seven years that we have been color-banding martins, we have recorded a 15% to 30% survival rate of fledglings during their first year of life.

Longevity: The oldest banded Purple Martin on record in the wild lived to be 13 years, 9 months old. Most martins live to be 3 to 7 years old.

Adult Mortality: About

50% of color-banded breeders disappear from one year to the next.

Age-specific Migration Timing: The first martins back in spring (i.e., the "scouts") are usually the oldest martins at the colony site. The first to return to old, long-established colony sites are 7-9 years old. They are followed in about a week by the 4- to 6-year-olds, who are then followed by the 2- to 3-year-olds, and finally the 1-year-olds (subadults).

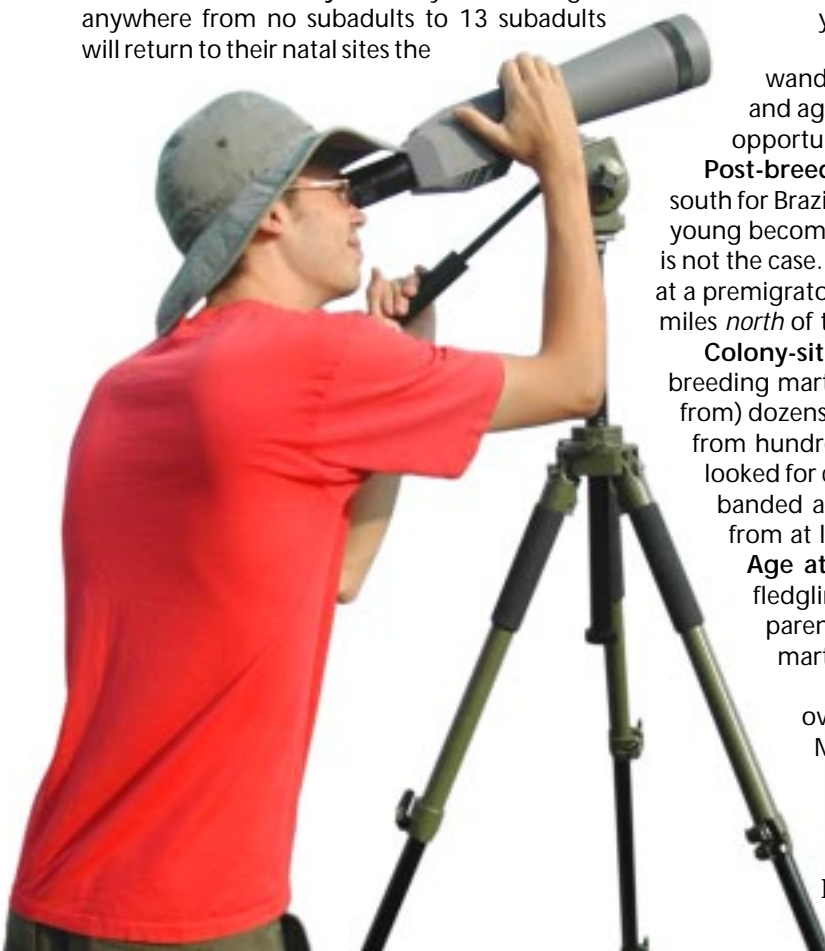
Bachelor Male Wandering: Subadult male martins will wander from colony site to colony site, returning to each one again and again throughout the summer, apparently looking for breeding opportunities, or prospecting potential breeding sites.

Post-breeding Behavior: Most landlords assume that their birds head south for Brazil when they disappear from their breeding sites or when their young become independent. *PMCA* banding studies have shown that this is not the case. Most parent martins are around for another four weeks or so at a premigratory roost, fattening up. Some of these roosts are hundreds of miles north of their breeding sites.

Colony-site Recruitment: Our banding studies have shown that the breeding martins at any given colony site are recruited from (i.e., fledged from) dozens of different sites; some are from nearby sites, while others are from hundreds of miles away. At one 50-pair colony site where we've looked for color bands for the past five breeding seasons (but have never banded at), we have now seen 80 different color bands, originating from at least a dozen different sites.

Age at Independence: By following known-aged, color-banded fledglings, and/or seeing them at the nearby roosts without their parents or siblings, we've been able to determine that young martins reach independence at about 40 days of age.

Post-fledging Wandering: Through the visual recovery of over 2500 color-banded martins at the Presque Isle Bay Purple Martin Roost, we now know that local premigratory roosts draw in birds from at least a 250-mile radius. We also know that fledgling martins wander and visit many non-natal sites in the weeks after reaching independence.





**Certificate of Appreciation
Awarded to**

JAMES R HILL III



BANDING DATA:

BAND NUMBER: 1162-67680

BANDED: 06/23/1999

SPECIES: PURPLE MARTIN

SEX: UNKNOWN

AGE OF BIRD: WAS TOO YOUNG TO FLY WHEN BANDED IN 1999.

LOCATION: NEAR BREMEN IN

**BANDER: CARTER T G MR
1919 N CHESTNUT AVE
ARLINGTON HGHTS IL 60004**

RECOVERY DATA:

LOCATION: PRESQUE ISLE ST PK PA

RECOVERED: 08/05/2001

A Certificate of Appreciation (like the one above) is issued by the *Bird Banding Laboratory* to anyone who voluntarily reports a banded bird to them. In this case, James R. Hill, III, using a 20x-60x spotting scope (like the one being used below left by *PMCA* employee, Pat Kramer), read the 9-digit *USFWS* aluminum leg band (1162-67680) on a live ASY female Purple Martin perched 80 feet away on an overhead wire at *Presque Isle State Park* in Erie, Pennsylvania on 8/05/01. This bird had been banded as a nestling on 6/23/99 by Terry Carter near Bremen, Indiana, 315 miles from its recovery spot.

Winter Roost Composition: Ultraviolet particle marking has shown that the martins from any given winter roost in Brazil disperse all over the North American continent to breed. Even different geographic races of martins (i.e., *Progne subis subis* (the eastern martin) and *P. S. arboricola* (western martin) winter together in the same roost trees.

How Do These Findings Help Purple Martins?

The first maxim of conservation is to know as much as possible about the species you are studying. As the primary research organization working with the Purple Martin, the *Purple Martin Conservation Association's* banding objectives are to collect data that will allow us to develop strategies to aid and support martin conservation on all parts of its breeding and wintering ranges. By increasing our knowledge of martin biology and behavior, we are better equipped to design conservation projects for the future. Because of bird banding, we now know more what to expect from the birds and therefore how better to accommodate their needs.

How Can Landlords Participate?

The *PMCA* needs many more landlords equipped with spotting scopes who are willing to put in some serious time looking for bands and recording the data. Banding and band

reading needs to take place in South America too, so the *PMCA* plans to build relationships with existing conservation organizations on both continents.

For those landlords wishing to pursue having their birds banded, the first step is to find a bander by checking with a local chapter of the *Audubon Society* or the biology department of a nearby university. Landlords can also make inquiries through their state or provincial wildlife agency. But before you get involved, ask yourself if you are willing to make the investment in time and equipment. Plan to spend a minimum of \$400-\$500 for a good quality spotting scope and tripod. You should also be willing to travel to as many colony sites as possible in your locality to look for banded birds.

Until broader-ranging *PMCA* banding projects are in place, what else can landlords do to participate? There are many ways landlords can take part in working to aid martins, with banding being just one of the options. Remember, too, that duplication of existing banding data is not needed. Some landlords will be able to have their birds banded simply because of their proximity to a licensed bander. Others, for the same reason, will not. Take part in *Project Martinwatch*, and become more involved with mentoring. Help a local school or park establish a colony site, and work with the students to help them manage the site. And remember that just by managing your own site responsibly, you are doing a great deal to help martins survive.