Protecting Martin Housing From Windstorms

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Sooner or later, almost everyone who puts up housing for Purple Martins must deal with the problem of windstorms. This article discusses methods for protecting housing from destructive windstorms that occur during the nesting season. Although storms will always present risks, the following suggestions for selecting and installing wind-resistant mounting pipes will minimize those risks.

Some degree of vulnerability to windstorms is inherent in almost all martin nesting structures, for obvious reasons: (1) Martin housing must be erected in an open area exposed to winds, at least 10 to 20 feet above ground level. (2) The multiple compartments that most structures offer to colonial-nesting martins present much more wind resistance than the individual boxes used by non-colonial nesters, such as bluebirds. (3) The total amount of wind resistance created by any particular nesting structure is increased by barriers and guards added for protection from climbing and flying predators.

Based on my experiences of the last 20 years, I would advise landlords not to rely on the presumption that manufacturers of commercial martin houses have anticipated the obvious and designed their houses and mounting pipes to withstand strong winds. Whether you use manufactured housing, or build your own, evaluate each structure and its mounting pipe critically, comparing the wind resistance of the structure and its predator guards relative to the strength of the mounting pipe. You may conclude that strengthening is in order, before a storm proves that point by blowing over your housing and destroying nests, eggs, and young martins in the process. The following observations reflect my experiences dealing with windstorms.

One preliminary point to consider is that even a small martin house, with a reasonably adequate mounting pipe, may become highly vulnerable to wind damage after the landlord has increased its wind resistance by adding essential predator guards or optional gourds. In 1977, I purchased a 12-room Trio Grandpa aluminum house and erected it on the manufacturer's steel mounting pipe. Although the pipe was made of thin-gauge steel and was not very strong, it was more-or-less adequate, because the house presented relatively little wind resistance. Following the instructions, I inserted the mounting pipe into a "mounting socket," consisting of another thin-gauge steel pipe (slightly larger in diameter than the mounting pipe), set in concrete. That is a good design feature, because strong winds might bend the mounting pipe or the ground socket pipe, but neither would be likely to break off, as would happen at a threaded pipe joint. Nevertheless, windstorms would turn the martin house by rotating the house and mounting pipe inside the ground socket. I corrected that problem by drilling a hole through both the mounting pipe and the ground socket, and inserting a steel pin (i.e., a large nail) through both pipes. Even so, from time to time strong windstorms would bend the mounting pipe as much as 10 to 15 degrees from the vertical, but for 18 years those small bends never destroyed nests, and I could easily bend the pipe back to vertical. In 1992, I hung four small gourds from the house, and added two climbing animal barriers (i.e., two 4' square pieces of hardware cloth) to the mounting pipe, increasing overall wind resistance. In 1996, I added substantial hardware cloth owl and hawk barriers to the Grandpa house, further increasing wind resistance. Soon after, a storm with exceptionally strong winds bent the entire house down to the ground, rupturing the mounting pipe (at the point it entered the concrete), and the Grandpa had to be retired for the season.

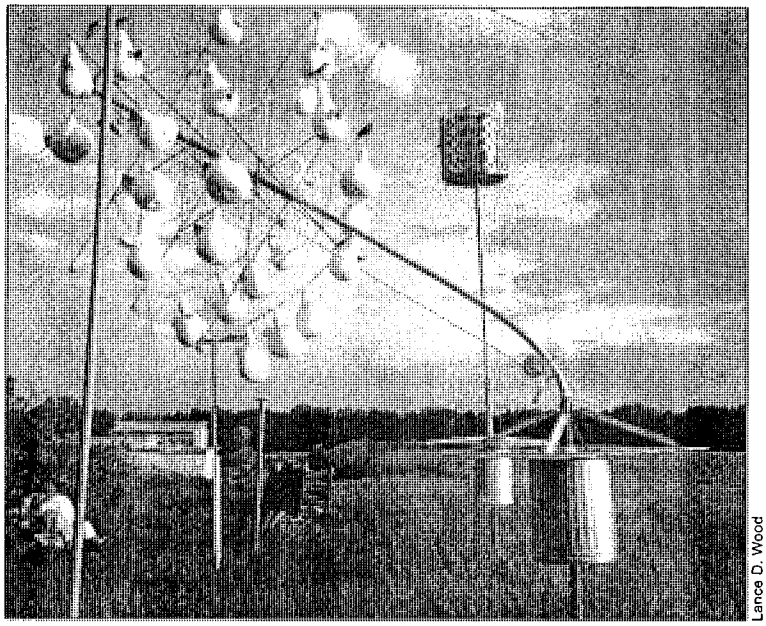
Undoubtedly, the thin-gauge pipe provided almost 20 years of service; so, relatively speaking, its ratio of pipe strength to wind resistance was not bad. However, I believe that every nesting structure must be fitted with pole guards and owl guards, in which case the manufacturer's mounting pipe may not be strong enough. One obvious solution is to replace the manufacturer's pipe with a much thicker and stronger pipe.

In contrast with the Trio Grandpa house, my years of experience with the 24-compartment Trio Castle martin house have convinced me that the manufacturer's mounting pipe is much too weak. Even though I have never hung gourds or anything else from the Castle that would increase wind resistance, on a number of occasions I have seen thunderstorms bend the mounting pipe so badly that the Castle ended up at an angle of 50 degrees from vertical. Although it's possible to straighten the pipe, the tilted angle of the house would surely destroy eggs or young. Other landlords have told me they've had similar experiences with their Trio Castles in windstorms.

Landlords should be aware that steel pipes are available from pipe supply companies, and come in many sizes and thicknesses. If you are not able to locate steel pipes wholesale, and then cut, weld, or drill holes in pipe, locate a welder, pipefitter, or plumber to serve as your consultant/contractor. With a welder's help, I easily solved the problem of the bent-over Castle by replacing the manufacturer's pipe with a much thicker, stronger "Schedule 80" steel pipe of the same diameter. In 1996, a large climbing animal barrier, which greatly increased overall wind resistance, was added to the newly-strengthened Castle. When the entire assemblage was tested by a storm with gusts of 90 miles per hour, the Schedule 80 pipe stood up to those winds with no damage. Any commercial pipe can be replaced with stronger pipe, in this way.

Landlords who build their own houses or gourd structures must decide what type of mounting pipe to use to protect against windstorms. Stainless steel pipes are remarkably strong, but their high cost makes them impractical. Galvanized steel pipes are much less expensive, resist rust for years, and are adequately strong if one selects thick-walled grades. Having had experience with several types of pipes over the years, I now recommend square, galvanized, 1/4"-thick tube steel, installed as described below, as the strongest, most practical mounting pipe available. If one chooses to use round

steel pipes, I would recommend the stronger, but still affordable, Schedule 80, as opposed to the weaker, less expensive, Schedule 40 pipe. Schedule 40 pipe is still much thicker and stronger than the thin-gauge pipes frequently provided by manufacturers. The photograph here shows what 90-miles per hour winds in May, 1996, did to a Schedule 40 pipe that supported a stainless steel gourd rack and 48 gourds. The photo shows only 24 gourds, because the other 24 were removed after the storm. The installation method prevented the Schedule 40 pipe from breaking, though it bent over badly. Martins nested successfully in all of the gourds left on the structure, even though some gourds hung at awkward angles. This reveals another advantage of free-hanging gourds: they can still be used successfully even after their mounting pipe has been badly bent. A house bent to that angle would be useless. The winds that bent the Schedule 40 pipe and destroyed the mounting pipe of the Grandpa failed to damage two large gourd racks, one on a Schedule 80 pipe, and one on a 1/4"-thick, 1&1/2"-square tube steel pipe. Conclusion: pipes of 1/4"-thick tube steel or Schedule 80 round steel pipe can resist strong winds that bend thinner pipes.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Wind gusts of 90 mph bent, but did not break, a Schedule 40 pipe holding a gourd rack. The same winds did not damage a Trio Castle mounted on Schedule 80 pipe, but destroyed the manufacturer's pipe for a TG-12.

While all of my housing is on steel pipes, I know that some landlords use pressure-treated wooden poles (e.g., 4-by-4's) to support their housing. I do not use wood, because if a pole breaks, the housing and nests may be smashed to the ground. In contrast, if thick-walled steel pipes are installed in the manner I recommend, they will not break; at the worst, very high winds might bend a pipe, leaving the housing undamaged and reusable.

To minimize the risk of wind damage, installation of the mounting pipe is just as important as the use of strong steel pipe. Mounting pipes should be anchored by being set in large, heavy blocks of concrete sunk well below ground level, so that windstorms will not overturn housing by pushing over the mounting pipe, effectively "lifting" the bottom of the pipe up through the rain-softened earth. Don't join sections of pipe with pipe couplings, pipe unions, etc., because the pipe is greatly weakened at the thread and a strong wind can snap off the pipe. Instead, "nest" a smaller-diameter mounting pipe (i.e., the pipe that actually supports the nesting structure) inside a larger-diameter pipe that has been set in concrete, (i.e., a "foundation pipe"). For example, a 2" (outside diameter) mounting pipe fits inside a 2&1/2" foundation pipe.

For a large structure (such as a large house or a gourd rack holding 30 to 60 gourds), I recommend the following approach. The principles described here are sound, and appropriate for a variety of materials. First, dig a large hole, at least 3&1/2' deep and at least 24" in diameter at the top, but flaring out to at least 36" in diameter at the bottom. Place an inch of coarse gravel at the bottom to aid drainage. In the center of the hole, stand upright, on top of a steel plate, the large-diameter "foundation pipe", into which the smaller mounting pipe will later be inserted. The steel plate is placed under the foundation pipe to ensure that the mounting pipe will not sink into the earth when it is dropped into the foundation pipe. My first choice for the foundation pipe is a section of galvanized, square tube steel, 2" diameter, with walls 3/16" thick; that pipe is extremely strong, and a mounting pipe made of galvanized, square tube steel, 1&1/2" in diameter, with 1/4"-thick walls, will nest inside. A round foundation pipe can also be used, with a round, Schedule 80 mounting pipe nested inside, but remember to drill a hole through both pipes and insert a strong steel pin, so that the wind will not rotate the housing and mounting pipe inside the foundation pipe. The foundation pipe should be at least 6' long: it will extend at least 3' below ground level (set in concrete), and extend at least 3' above ground level. Of course, the further above ground level the foundation pipe extends, the stronger is the total pipe combination, but the more difficult it is to lift the mounting pipe and nesting structure when the time comes to insert the 15 to 20' mounting pipe into the foundation pipe. These pipes are heavy; I use a "cherry picker" bucket truck and a crew of four men to erect the mounting pipes and nesting structures safely.

With the foundation pipe upright in the hole, use a level to get it vertical, and hold it in place with braces. Fill the hole around the pipe with concrete, up to ground level; allow several days to harden the concrete. The larger, heavier, and more deeply buried the concrete block that anchors the foundation pipe is, the more certain it is that no windstorm can ever blow over the entire structure. Later, install a climbing animal barrier and martin nesting structure, and insert the long mounting pipe into the foundation pipe.

Used together, I believe the materials and installation methods outlined here will defy storms with wind-strength approaching that of hurricanes or tornadoes. You will worry much less about storms if you have protected your martin housing and the eggs and nestlings within from strong winds.

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