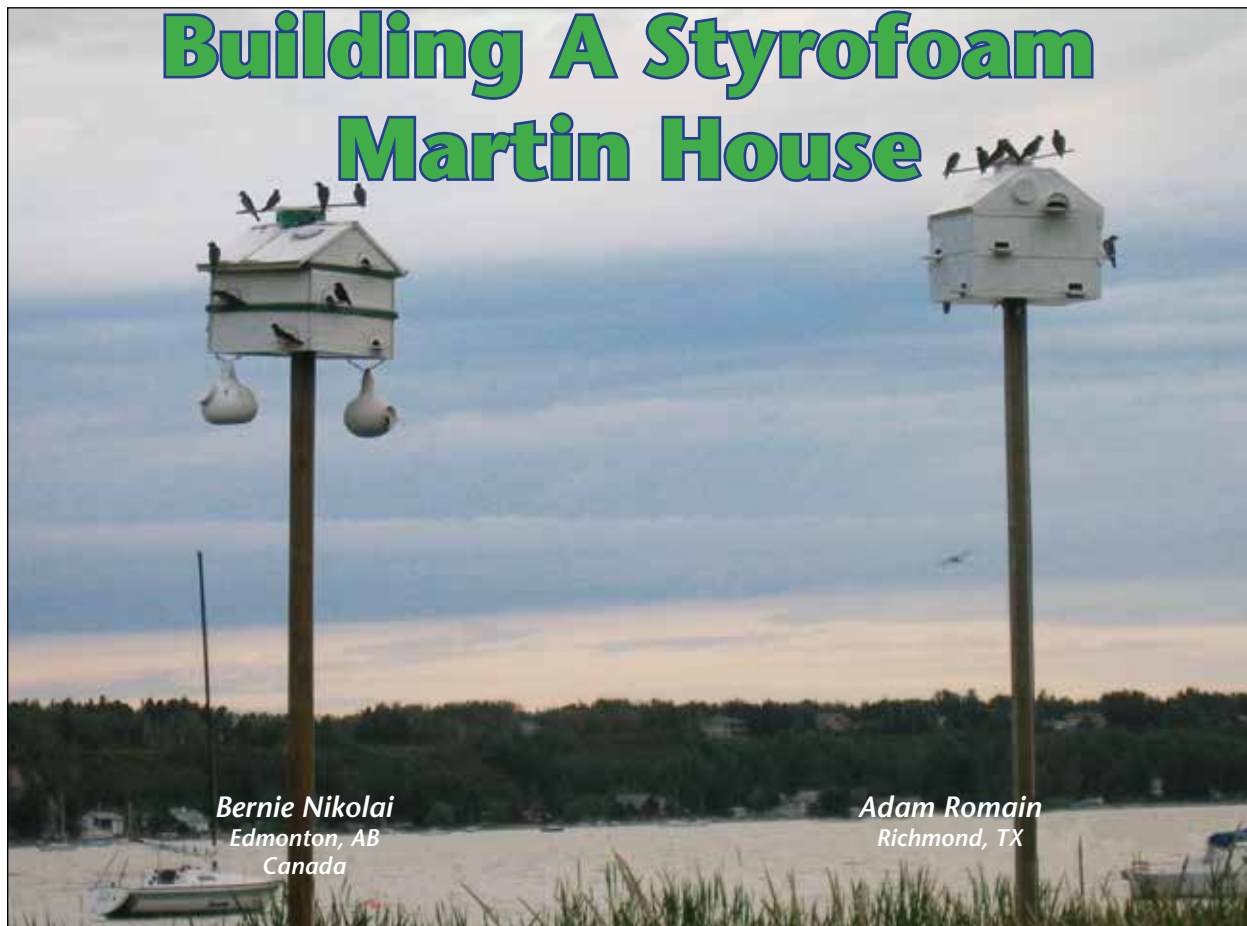


Building A Styrofoam Martin House



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Two of Bernie Nikolai's Styrofoam martin houses. The house on the left is 100% full in its second year of use. The exterior has vinyl house siding glued on with PCCA to protect it. The house on the right is new this year and 8 of 10 compartments are occupied. The outside and inside are coated with epoxy and fiberglass cloth, which forms a hard shell to shield the foam from hail or bird beaks. The martins seem to like the Styrofoam houses, and they seem sturdy enough to take years of use.

In just two years my colony on Lake Wabamun, 45 minutes west of Edmonton, Alberta, has grown from three pairs to 29. One thing that is unique about this colony is that it has been a testing ground for a different type of martin house—a homemade Styrofoam house that is inexpensive and easy to make, lightweight, requires minimal tools, and offers excellent insulation as protection against very hot or cool weather. It adds the insulation factors of about 5 solid inches of cedar for protection against both cold and heat.

My interest in finding effective martin housing that could help increase the population, especially here in the north, is what led me to try Styrofoam. I started experimenting with single-unit Styrofoam chalets in 2004 and sent some to friends in Texas, Oklahoma, and Tennessee. I was pleased when five of those six chalets fledged martins, demonstrating that Styrofoam housing functioned as well in the south as it did in the north.

This season I tested three houses, each with a different construction approach. One is coated with vinyl house siding, one is coated with fiberglass cloth and a couple of coats of epoxy, and the third has plastic signboard on the bottom level, and epoxy on the top level.

As of May of this year the compartments were basically all taken and the SY (subadult) birds were yet to arrive, so it looked like I had a chance at a full house, or 33 pairs here out

of a possible 33 compartments. I don't want to come across as boasting, but for a colony on the extreme northwest edge of the martin's range, this is very impressive growth. All the birds here so far are ASY martins, so they must be leaving their old colonies because they like what they find here.

The bottom line is I think there is a lot of potential in Styrofoam houses if a coating is put on them to make sure they are durable. The martins seem to be voting with their nest building, and giving these houses a "two toes up". I think a design using one entrance per side with staggered entrances, [as in the first two photos] dramatically reduces male dominance issues and allows for 100% occupancy, vs. other apartment designs.

Styrofoam House Overview

A 10 or 12-unit house can be built for about \$20 worth of Styrofoam, which comes in inch-thick, 4' by 8' sheets. I recommend either the blue Dow foam board as it has the highest compression, or the pink Owens Corning product. The 1" Styrofoam is R5 rated, or about as warm as 5 solid inches of cedar. Yet the apartment houses weigh about 8-10 lbs, except for the one covered with vinyl siding, which weighs about 15 lbs. The floors separate for nest checks—it's very easy to lift a level up and peek inside. Gravity and a top plate

over the pulley at the top of the pole hold the levels securely in place once the houses are raised. The houses are easy to raise and lower for nest checks with just a rope and pulley, no winch needed.

Designing the House

Other than single-unit chalets, I built two basic models, a flat roof (really easy) and a peaked roof that looks nicer but takes longer to make. The martins nested in both, showing no preference for one style over the other. I do not have any plans or exact dimensions for the Styrofoam houses—I sort of wing it as I go. I don't think the martins care if their nest area measures 72 sq. inches inside or 100 sq. inches. Personally, I think the absolute minimum for good martin housing is 60 square inches, or about 6" wide by 10" long. In my opinion, 6" x 6" compartments are far too cramped for Purple Martins.

For the Styrofoam houses I've made, the base is 24" x 24", the walls are 6" tall, and the center square hole for a wooden 4" x 4" post (which actually is 3-1/2" x 3-1/2") is 4" or slightly wider, square. This will give an inside compartment size of about 8" x 13", or 104 square inches. Don't be afraid to modify these measurements within the acceptable range (absolute minimum of 60 square inches to around 100 square inches). My feeling is you would want at least 6" x 12"/72 square inches or a bit more for the nest compartments.

But you absolutely must use starling-resistant entrance holes (SREH), or every starling for miles around will compete to nest in the compartments. I initially had poor success with Styrofoam houses, when I used the combination of oversized compartments and round entrance holes. Starlings

nearly killed themselves to nest in the roomy foam houses. I switched to all SREH in 2005, and experienced a population explosion of nesting martins, specifically 11 ASY pairs and five SY pairs. And I did it by going cold turkey, changing every compartment from round to SREH entrances by adding plastic plates with either WDC (a modified Excluder entrance) or crescent entrances. The Alberta martins scooted into the starling-resistant entrances as easily as round holes and showed no hesitation whatsoever in using SREH entrances.



Adam Romain

Top: A bird's-eye view of the floor plan for one of Adam Romain's houses. The pink pieces of foam are used to raise nests and function as a subfloor/nest tray. The nest compartments are accessed by separating the floors and then removing individual lids or covers for each room (not shown.) **Below:** A view of the top floor with half of the roof yet to be glued on. The top level offers two attic compartments. The hole in the upper right will allow access to the compartment via a collar and threaded cap.

thane construction adhesive (PPCA) to glue the foam pieces together and add a few 2" wood screws to hold the pieces together while the PPCA sets, about 12 hours. The exact product I have found best is made by LePage and is called PL Premium. This may be a Canadian brand, but there are others made in the USA. It costs about \$3.89 a tube up here, and one tube will easily make one or two houses. I leave the screws

Cutting & Gluing the Styrofoam

There are two ways to cut the one-inch Styrofoam sheets. The first method is to cut along a straight edge with a razor knife (box-cutter.) You can use a wooden yardstick or metal straight edge. Don't try to cut all the way through the board in one cut, as it will snag and will not make a straight, sharp cut. Instead, make a series of three or four cuts, each one a bit deeper and in the same channel. The second way is to use an electric foam wire-cutter, a wire that is heated via a battery charger. It works great—the wire actually melts the foam as it passes through. This method is best for mass production and is the way foam blocks are cut into foam sheets. For just building a few houses, the box-cutting knife is the way to go.

Next, assemble the floors one by one, gluing the room dividers to the floors. I used a premium polyure-

in afterwards—their main purpose is not to add strength, but rather hold the house tightly together while the PPCA sets. If you use only screws to hold the house together, the screws will pull out if you really yank on the walls of the house. Once set, the foam will rip before the adhesive gives away.

Assembling the House

Since the floors/levels are all the same measurements, you just stack two or three on top of each other, and the walls line up just fine. Since the walls are one inch thick, there is plenty of room if you are off 1/8" or so. Top the stacked levels with either a flat or peaked roof. Once the house is raised completely, it is pressed against the top piece at the top of the pole just above the pulley, so the levels do not move, no matter how windy it gets. You can also glue on a strip of lath (as in my peaked house photo) to hide any join lines between the levels.

Finishing the Exterior and Interior

The biggest potential concern I have with Styrofoam housing, is will it stand up to hail and owl attacks on the outside, as well as nesting activities by the martins on the inside. The roof and exterior walls can be covered with plastic signboard, thin plywood, fiberglass cloth & epoxy, or vinyl siding for protection. The vinyl house siding works well, but adds about 5-6 lbs. to the total weight. The fiberglass/epoxy coating makes for a very durable, hail-proof coating. To protect the inside floors against scratching by martins or House Sparrows, they can be covered with a thin piece of plywood or coated with a layer of epoxy, which will give the floor a tough, rough, stucco-like coating.

We get some pretty good prairie thunderstorms with hail in my part of the country, and so far, so good. None of my test houses or the Styrofoam test houses of others try-

ing them has been the victim of an owl attack yet. Actually the Styrofoam would be an excellent sound muffler, and may have an added advantage of blocking nocturnal martin vocalizations that can attract owls. [Editor's note: As with all types of martin housing, a pole guard to stop raccoons and snakes is recommended. Bernie's location in Alberta has neither snakes nor raccoons to contend with.]



Adam Romain

Adam Romain's updated 2006 house was modified to work on a rope and pulley system instead of a telescoping pole. This required creating a channel through the floors so the house could slide up and down the pole, and making a stop to anchor the house securely in position once it was completely raised. The green trim on the sides is functional as well as attractive. The wood strips help hold the levels together snugly, and help to keep blowing rains from getting inside. The attic rooms are accessed by caps while rooms on the lower floors are reached by lifting the floors to separate them and then removing a ceiling insert.

for very effect martin housing that is easy to build and very inexpensive. They stood up very well to very strong winds, and are probably sturdy enough to stand on without breaking.

My friend Adam Romain has also done some testing. In 2004 he had one pair of martins nesting in a plastic S&K house. In 2005 he built a 6-unit Styrofoam house and hung four gourds under it. He ended up with two pairs in the S&K house and nine pairs in the Styrofoam house and gourds—90% occupancy its first year up. And his site went from one pair to 11 pairs in just one year. The Styrofoam house worked just did as well in the Texas heat as it did in the Alberta cold.

Adam's Modifications

I built my first Styrofoam house in 2005 with the help from many others, but especially Bernie and Emil Pampell. The house was constructed to have three levels, with two compartments in the roof section and four compartments on each of the lower levels, making it a 10-unit house. I was using a telescoping pole and did not trust it to support three levels, due to wind concerns rather than weight. So I only put up two levels, plus four gourds. The construction of the peaked roof was a little daunting, but once I got started I was able to make things work and fit by hand.

A potential problem Bernie had mentioned was the issue of the levels separating and exposing four compartments. To solve that issue, I added individual lids or covers for each compartment. This makes nest checks easier since the floors can be separated without exposing all the compartments. I also added some wood trim on the sides where the levels butt together. The trim covers the spot where the levels meet. This helps keep the entire structure together and also, I believe, helps keep rain from our strong thunderstorms out of the compartments.

For the 2006 season, I used a new pulley-operated pole, an EZ Lift, and so any support concerns were eliminated, allowing me to put up all three levels plus the gourds. With that modification completed, I needed to adapt the house so it would raise and lower on the EZ Lift, which meant cutting a hole in the roof and enlarging the holes between the levels. As you can see in the photos, the levels would actually work with a 4 x 4 post such as Bernie uses. I needed to construct a stop for the house in the fully raised position. I made a stop out of wood for the house to lodge up under and also used the block to mount several perches.

Once that was done, all that remained was to prepare some natural gourds and assemble the levels, roof, and gourds, then raise it up. In 2005 it had nine out of 10 compartments occupied—I hope to fill all 14 compartments this season!

The martins scratched the floors up some last year, making their nest bowls, so I added a subfloor made from an additional piece of 1/2-inch Styrofoam. This leaves the nest area of the compartment raised above the floor, a good idea in case any rain was to get inside. The subfloors can be replaced very easily if need be. The martins didn't bother the walls,

but a pair of starlings that breached the WDCs almost pecked through them before they were eliminated.

And a final note, just remember, the house was basically built using only a box cutter and straight edge along with the Styrofoam and PCCA. The house you see was built for under \$100 and almost half of that was spent on entrance plates. That's a huge difference from the cost of most aluminum houses. I encourage anyone to try a Styrofoam house if they are struggling with the cost of commercial housing.

Now, I just hope that the martins like the set-up! The only sad part about this year is that I took down one house when I added the extra level to the Styrofoam house. Although I had 12 pairs nest last season, three pairs, including my original colonizing pair, were in the other house. I just couldn't stand putting up the house with the small compartments again. Although I'm sure I will see the martins hover where the old house was raised and they may abandon, I know that this new housing with the larger rooms will be much better for the martins in the long run.

End of Season Comments:

My fears were all for nought because the 2006 martin season was the best yet. While I offered 14 cavities, I had 15 active nests. You might wonder how that's possible—well, a subadult pair moved in right after my first ASY pair had fledged their young. In total I had 15 nests, 81 eggs, 68 young hatched, and 55 young fledged. Not bad numbers! One ASY male got run over in the street, but the widowed female then paired up and nested with a subadult male.

Bernie Nikolai is Vice President and Senior Investment Advisor for TD Waterhouse, a major Canadian stock brokerage and investment firm. He has been fascinated by Purple Martins since his earliest boyhood days in Winnipeg, Manitoba.

Adam Romain has had a martin colony for three seasons now, starting out with one pair of SY (subadult) birds. He is currently a Sr. Project Manager with Sysco Foodservices in Houston. Says Adam, "I'm married to a lovely wife named Lori and we have a soon to be 5-year-old named Evan. He loves to help with all aspects of the martin season, especially the nest checks. He calls them "his" martins!"



Adam Romain

A finished Styrofoam house can look very clean and professional, as does this one of Adam's. Note the staggered entrances, one entrance per side per level, and individual porches rather than a continuous, wrap-around porch. Both features help increase occupancy rates, as both Bernie and Adam can attest.

