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Urban Survival Shelters - Part 1 Cold Weather Shelter

There is no lack of media covering wilderness shelters. Practical Survivor wanted to touch on an area of survival often ignored, Urban Survival shelters. We usually choose to put ourselves in situations such as backpacking, mountaineering, camping, hiking, fishing and hunting. If an emergency occurs during any outdoor sport, we may have the need for that particular emergency and we should be able to build a wilderness shelter. Many of us dream of spending more time in the bush but the reality is, most of us cannot afford to stay in the wilderness. Most job opportunities are found within metropolitan areas. Some of us live out in a rural area, but travel to urban areas are still at risk. In other words, the vast majority of people spend a huge part of their life living in or near an urban environment. We wrote this article to show how every day items found in a trash dumpster can be used to make an emergency shelter. Hopefully we can learn to use the same wilderness / bushcraft shelter building skills in an urban environment. Hopefully by now, you have taken the time to read and learn about the differences between an urban survival kit and a wilderness emergency kit. As a survivalist we have to adapt to overcome the situations that we could face. Once we begin to think on ways to adapt, we realize leaves can be replaced with newspaper, branches can be replaced with pieces of pipe or wood from a fence. Are you getting this? Then follow us....

URBAN SHELTER

Dictionaries define the word shelter in different manners, but this was our favorite.

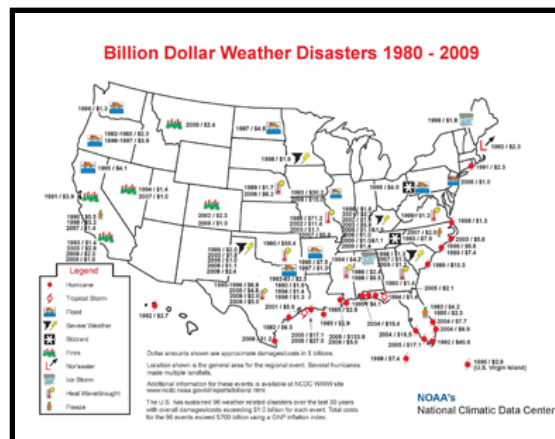
"1. something beneath, behind, or within which a person, animal, or thing is protected from storms, missiles, adverse conditions, etc.; refuge.

4. a dwelling place or home considered as a refuge from the elements: Everyone's basic needs are food, clothing, and shelter."

<http://dictionary.reference.com/browse/shelter>

"Protected from adverse conditions." Most people immediately think of wilderness shelters. But what if the adverse condition is found within your home ? The power is out and the temperature in your home drops to below freezing. Every year, people die to hypothermia and hyperthermia within their own homes. Perhaps a heat wave or hurricane causes power losses within your city. It is not just the elderly and sick that we read about in the news. Recently a **thirty year old man** died in his own home when the electricity in his home was shut off. They say he was unable to pay his electric bill, and he succumbed to the frigid temperatures within his home. Often times hypothermia will confuse the person and they are found with little clothing on. A house is a form of shelter, but without gas or electricity, are you certain you could survive. Other urban emergencies such as fire, hurricane, and floods could put us in a position where we need an emergency shelter. Consider for a moment what would happen in most cities if suddenly the electrical power was shut off during the winter months.

Want examples ?



ncdc.noaa.gov

* Hurricane Katrina

Loss of life

Final reports indicate that the official death toll, according to the Louisiana Department of Health, was 1,464 people.

* Northeastern United States blizzard of 1978

"Aftermath and recovery

Boston and Providence recorded all-time highs for 24-hour and storm snowfall records. Many people were left without heat, water, food, and

electricity for over a week after the storm finished. Approximately 10,000 people were forced to temporarily move into emergency shelters. Some 2,500 houses were reported seriously damaged or destroyed and 54 people were killed, many from fallen electric wires." - http://en.wikipedia.org/wiki/Northeastern_United_States_blizzard_of_1978

*** Hurricane Floyd**

*** Heat Wave of 1980**

*** North American blizzard of 1978, 1993, 1996, 2009, two blizzards in 2010**

"Approximately \$3 billion in damage and 187 deaths were caused by the Blizzard of 1996 and the flooding that followed." Granted a lot of the deaths are caused by vehicular accidents and heart attacks from people overexerting themselves. But this is usually in situations where most people have electricity or gas to heat their homes. Some blizzards cause floods when the snow and ice melt.

Floods

"During the 20th century, floods were the number-one natural disaster in the United States in terms of the number of lives lost and property damage." -

<http://ks.water.usgs.gov/pubs/fact-sheets/fs.024-00.html>

Whether it is a tornado, earthquake, flood, or hurricane learning basic emergency shelter skills can prove to be a valuable asset. Although the emergency personnel will do whatever possible to help you, sometimes the system is overwhelmed. It could be days before they can rescue you and your family.

Some of the same techniques used in wilderness survival shelters, can be implemented in an urban emergency shelter. We need to minimize the loss of heat. Convection, if the windows and doors are closed we lower heat loss by convection to the body. If your home is intact having a roof and windows should help lessen the effects of Hypothermia or Hyperthermia. In a warm weather emergency, Hyperthermia (High, Heat) is the enemy. The temperature at which the human body operates properly is narrow. A few degrees in either direction and our bodies behave erratically or we simply die. Hyperthermia is overheating of the body, this usually happens when the body is unable to regulate temperature through perspiration and proper fluid replacement.

In the case of Hurricane Katrina, people were left on their rooftops in the sun waiting for rescue. In this event staying out of the sun and hydrated was paramount. A person can only live a few days without water before the body begins to deteriorate rapidly and dehydration overwhelms the mind and body.

Cold weather Urban Shelter

For the scope of this article we will concentrate on cold weather urban survival shelters. We build one example of a shelter than could be used to protect the body from hypothermia. So as with any other cold weather survival circumstances, the killer is heat loss. How do we protect ourselves?

Conduction

Add layers between your body and the layer you will sleep on. Simply pay attention to what your body is coming in contact with. Since our house helps minimize wind currents our goal is to minimize the area we have to warm up. In other words, lets build a shelter within our home. Perhaps when you were a kid, you used to build a fort in your bedroom. This will be our survival fort.

Convection

Protect the body from heat loss from air currents. Use insulating clothing and shelter materials to trap air and minimize heat loss.

Radiation

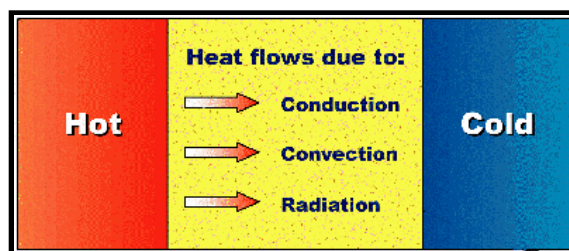
At night the sky turns into a giant heat sink. Simply putting a roof over our head would help reduce heat loss through radiation.

Evaporation

We have to remember heat loss through breathing and the negative effects caused by the moisture our body exhales.

With this in mind, our goal is to use the available materials to protect us from the wind, the rain, and the radiative heat loss. Materials such as cardboard, plastics, carpet, and rugs are very common within our homes and city trash bins. We can learn from the homeless. They use cardboard and newspaper to help stay warm during the winter months. Imagine your cardboard being drywall and shredded newspaper our fibreglass insulation.

Side Note: If an alternate heat source is not available within your home (kerosene stove, fireplace or gas), candles can be a source of heat. Using alternate heat sources can be a fire hazard and extreme care must be taken. Fire sources within a makeshift urban shelter should not be used.



<http://www.ornl.gov/sci/>

INSULATION

In the wilderness, we use leaves, wood, snow, and earth as insulators. Urban environments have an almost endless supply of insulating materials. Cardboard, Styrofoam, plastic, and cloth. One visit to a trash dump and you can gather enough material to build a great shelter. Look around your house,

what can be used as insulation for a shelter. That large box the TV or refrigerator came in, can be used to build a small shelter within your home. The cushions on your furniture can make walls for a makeshift shelter as well. Think ahead of time and plan. If you are able to store some cardboard and Styrofoam in your attic do so. It is always a good idea to have an emergency kit ready with essential items.

In order to better understand proper shelter building, it helps to get some basic knowledge of insulation (R-value) and heat transfer.

What is R Value ?

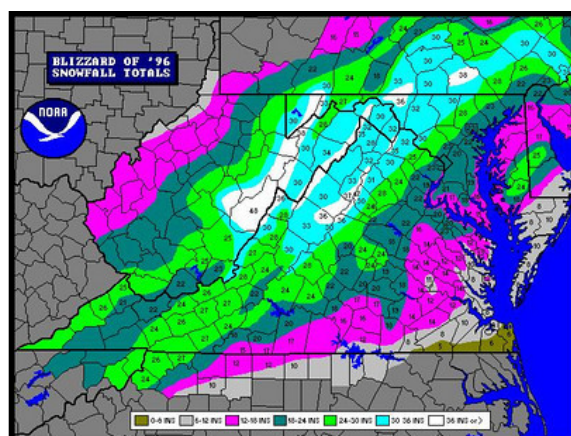
"The R value or R-value is a measure of thermal resistance used in the building and construction industry. Under uniform conditions it is the ratio of the temperature difference across an insulator and the heat flux (heat flow per unit area,) through it or . The bigger the number, the better the building insulation's effectiveness. R-value is the reciprocal of U-value.

The U-value (or U-factor), more correctly called the overall heat transfer coefficient, describes how well a building element conducts heat."

[http://en.wikipedia.org/wiki/R-value_\(insulation\)](http://en.wikipedia.org/wiki/R-value_(insulation))

So we could say that R value is the measurement of a material's resistance to heat flow. In a cold environment, we want the material to have a high R value. The R-value of cardboard, and Styrofoam are important to an urban survivalist. Cardboard and Styrofoam are readily available from most trash collecting sites. Go behind any furniture or hardware store and you can find large boxes full of insulating material. The R-value of the cardboard and the Styrofoam could vary with the thickness of the material.

So we use this knowledge and we build a box within our home to sleep in. A smaller area to warm up, our own body heat can increase the temperature within the cardboard shelter. Sound familiar ? Of course it does ! In the wild, we build debris shelters and snow caves. We minimize the size of the shelter so we can warm up the shelter with our own body heat.



How does insulation work?

"Heat flows naturally from a warmer to a cooler space. In winter, the heat moves directly from all heated living spaces to the outdoors and to adjacent unheated attics, garages, and basements - wherever there is a difference in temperature. During the summer, heat moves from outdoors to the house

interior. To maintain comfort, the heat lost in winter must be replaced by your heating system

Batts, blankets, loose fill, and low-density foams all work by limiting air movement. (These products may be more familiarly called fiberglass, cellulose, polyisocyanurate, polyurethane, and expanded polystyrene.) The still air is an effective insulator because it eliminates convection and has low conduction. Some foams, such as polyisocyanurate, polyurethane, and extruded polystyrene, are filled with special gases that provide additional resistance to heat flow.

Reflective insulation works by reducing the amount of energy that travels in the form of radiation. Some forms of reflective insulation also divide a space up into small regions to reduce air movement, or convection, but not to the same extent as batts, blankets, loose-fill, and foam"

http://www.ornl.gov/sci/roofs+walls/insulation/ins_01.html

What will be our heat source?

**** Output of heat on a human body ****

"The human body maintains a basic minimum rate of heat production at about 250 Btu/hr during sleep, the heat equivalent of about 75 watts, and about 400 Btu/hr (120 watts) when awake but sedentary. As bodily activity increases, the rate of oxidation of food, with its attendant release of energy, must increase. The level of heat production for light work will be about 650 Btu/hr (190 watts), the extreme value for heavy work, about 2400 Btu/hr (700 watts)."

http://irc.nrc-cnrc.gc.ca/pubs/cbd/cbd102_e.html

Lets try to put the information we have gathered to use. A basic understanding of heat transfer and insulation should help us build a better shelter.

Normally the heat from a fire, or candle rises quickly into the open air and most of the heat is lost. What we want to do is trap the heat being created by our body within the shelter while still allowing us to have a proper source of oxygen. An important question would be "Is your home structurally sound after the emergency?". Is the roof intact, are the windows undamaged. If the windows are damaged, then perhaps covering the windows with wood would be our first step. We will run the shelter tests outdoors to show the difference in temperature that can be created by proper insulation.

Note: If the roof is blown off your house during a hurricane , or you find yourself outside in an urban survival situation, adding a layer of any plastic or tarp found in the trash would help to water proof the shelter. In the wilderness we use leaves or pine boughs to create a roof shingle effect. Be creative!

In order to heat or warm a home some things taken into consideration are:

- * How well insulated is the home?
- * What is the size of the area needed to heat?

We use the same mentality while building our urban shelter. Keep it smaller and use any available materials to insulate. If building the shelter inside your house, we can use items such as seat cushions, blankets, cardboard, plastic, bed mattresses, trash bags, newspapers, magazines, books, aluminum foil, Styrofoam, curtains, and rugs.

* If the house was damaged, hopefully at least one room will be salvageable. If the roof is undamaged and the windows can be sealed, Then our first step could be insulating a room within the house by using plastic sheets over the windows, and crumpled newspapers between the window and the plastic to trap air. Perhaps use wood or rigid foam insulation (Extruded polystyrene foam XPS also known as blue board) to insulate windows in our home. *



Sample cold weather Emergency Shelter

Do you remember what we said about the output of heat from the human body? We decided to put that human heat to use within our cold weather urban shelter. With the use of cardboard and Styrofoam, we build a small one person shelter.



Materials:

- * Refrigerator cardboard box
- * Styrofoam found within the same box and dumpster.
- * Duct tape
- * Box cutter
- * Tape measure
- * Marker

If the circumstances force us to build the shelter outside, we should protect

the shelter from moisture. We could use multiple layers of trash or any available plastic. (trash bag, tarp, poncho, carpet, sheet metal, wood, rugs) The refrigerator box can be replaced with boxes from big screen TVs or whatever is available. Most families have boxes in their attic. Local furniture stores are usually happy to let people take away their trash. Call and ask for permission. A lot of furniture and hardware stores will give you cardboard. We built the shelter as a triangle, in order to minimize the walls we would have to insulate. Lets not forget, a smaller shelter is easier to warm up with body heat. If we wanted to squeeze two people in the shelter, we could choose a rectangular configuration. I guess we can call our shelter, an urban emergency survival A-frame or urban A-frame shelter.



We use the tape to stabilize the shelter and begin the measurements to close off the ends of the shelter. This is where the cutting device and pen/marker comes into play.



We mark the cardboard, so we can cut the ends properly.



We close up one end of the cardboard a-frame shelter and begin insulating using the Styrofoam and duct tape.



Since heat flows naturally from a warmer to a cooler space, we are adding insulation so we can lessen the effect of conduction with the cold concrete. We also minimize convection by trapping air inside the box shelter. We have multiple layers trapping the air and the Styrofoam insulation to get us off the ground. In a wilderness a frame, we use leaves or pine boughs to create the air trapping effect, and insulate us from the cold ground.



Once we finish the insulation, we build a door so we can shut it behind us. If the shelter was to be used multiple days outside, we could cover it with multiple layers of cardboard and items such as rugs, carpet, plastic, trash bags anything that would help waterproof the shelter.



Almost finished. We want to insulate the door as much as possible. This will be our number one source of heat loss.



Note: making the shelter completely airtight is pretty difficult. It would seem this does not need to be mentioned but think safety! YOU SHOULD NOT MAKE THE SHELTER COMPLETELY AIR TIGHT ! The law of threes, you cannot live much over three minutes without oxygen. Use common sense please.

Side note: There are several models of this shelter we are experimenting with. One we separate the area of the shelter where the body is to be, from the head. This allows us minimize heat loss by respiration and the moisture caused by breathing. All this while allowing proper ventilation.



We add the finishing touches to the insulation. Getting inside the shelter with a light source outside, will help find any holes. The wind should help find drafts.



Now we are ready to put our shelter to the test. For the experiment, we use a dual sensor thermometer. Lets see how our shelter performs by putting the shelter through the practical survivor test!



We make sure the thermometer is working properly by taking a measure with both thermometer sensors. The temperature outside is 36.6 degrees Fahrenheit (°F) - 2.55 degrees Celsius (°C). The time is 4AM. The wind is blowing at about 7 MPH, but lets just ignore that factor. If the experiment was to be done in much lower temperatures, we could simply add another layer of cardboard to trap the air further. Please ignore the AM/PM stamp, we set the clock incorrectly until we noticed later on. (Obviously it is nighttime)



We climb in, it is a little tight, but that is what we wanted. We are looking to stay warm. We made a door handle out of parachute cord. We seal up the lower parts of the door to lower the cold air drafts sneaking into the shelter. As soon as we get settled, the temperature starts to raise. Within twenty minutes there is a twenty-two degree difference. Hard to believe ? We thought

so too.



Note: We are wearing normal clothing. We are wearing a long sleeve shirt, a hooded sweatshirt, a pair of jeans and wool socks.



So what was our final temperature? Using just the heat from our bodies, we were able to get the temperature inside the shelter to 65.6 degrees Fahrenheit (°F) +/- one degree as it stabilized. The experiment started around 4AM and the last temperature reading before opening the shelter was taken at 5:26AM. We have part of the experiment in video. At first we thought of creating a video of the entire process, but it just seems like a long boring video. Please

research the R-Value of cardboard and Styrofoam.



RESULTS

* Outside temperature: 34.5 degrees Fahrenheit (°F)

* Inside shelter temp: 65.6 degrees Fahrenheit (°F)

31.1 degrees difference

- We could let the experiment results do the talking.

Yes we could state the obvious, with proper preparation and equipment, hopefully we would never have to build a shelter out of makeshift materials. A good sleeping bag and blankets can go a long way. The same mentality and attitude that we take towards fire starting is carried over into other areas of emergency preparedness. Yes we carry a lighter, but we also carry a Ferrocerium (Firesteel) rod and we know how to start a fire by friction. Perhaps your equipment is lost during the emergency or we could help someone else who is not equipped for the emergency. In other words, always know multiple ways to resolve your ESSENTIAL NEEDS. (Fire, Shelter, Water, Food) The order of the needs will be determined by the situation.

There are a number of books discussing urban survival. Some of the information found within these books can be very helpful. A few books are posting information that is inaccurate and dangerous. Our advice is put anything you read to the test whenever possible. Going over the different scenarios will not only help us know what works in our particular area, but it will build confidence. We can never be prepared for all contingencies, but we should try to go over the situation both mentally and physically when possible. Repetition is the key to success. What would we do if a flood or blizzard or flood was to move in suddenly. Of course knowing what possible scenarios could affect your area are essential. Preparing for a blizzard in

Texas probably should not be on the top of your priority list (it has happened). The point is to think, what type of shelter for what situation. We live in a flood prone area, so flood preparation is high on our list. Hurricane Floyd killed 52 people and wrecked 17,000 homes in North Carolina. Once we lost power over a week due to an ice storm.

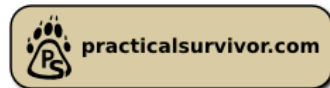


Hurricane Floyd North Carolina - research.unc.edu/

This is just one example of cold weather urban shelters. There is no way we could cover all the possible shelters in the scope of this article. Properly tested urban survival techniques would take a large book to cover. What starts to happen with time and experience is we begin to see everyday items as survival materials.

Again, other options of inside the home shelters can be made using your furniture and cushions. A futon mattress can be rolled into a improvised sleeping bag. Several bed mattresses can be structured to build a shelter. Use sheets, blankets, rugs, curtains, and extra clothing to build a shelter within your home. If your home has been destroyed, often debris can be used to build a shelter. Plastic sheets, trash bags, cardboard, wood can be used to build modified a-frame, lean-to type shelters.

Remember, Do not live paranoid, just live prepared.



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