



# Emergency Preparedness

STRATEGIES AND CONSIDERATIONS FOR SURVIVAL UNDER EMERGENCY  
CONDITIONS AND SCENARIOS

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# Red Pill vs. Blue Pill

## How bad can this get?

### Symbolism of Choice

The red and blue pills symbolize a fundamental choice between **truth** and **ignorance**, inspired by a famous movie scene; "*The Matrix*"

### Seeking Reality

Choosing the red pill means opening oneself to truth and reality, even when it is uncomfortable or challenging.

### Staying in Unawareness

The blue pill represents the decision to remain in comfortable ignorance, avoiding difficult truths.

"Now, I am become Death, the destroyer of worlds" -- J. Robert Oppenheimer, July 16, 1945, upon observing the first Trinity atomic bomb explosion.



# Imagine Life without:

Electric Power

Clean water and sanitation

Stable food sources

Protection and security

What would be affected?

- ??????????????????  
Hint: think 1800's

How could it happen?

- Cyber attack on electric grid
- EMP/Large solar flare
- Civil unrest
- Natural disaster (weather, EQ)

Timeline(s):

- First week
- First month
- Three to six months: starvation, disease, civil unrest; 80-90% population loss
- One year and beyond

# Threat Scenarios, 101

- ▶ What would be affected? (Hint, think 1800's)
- ▶ How could it happen?
  - ▶ Cyberattack on electric grid
  - ▶ Natural disaster
  - ▶ Civil unrest
  - ▶ EMP/solar flare “coronal mass ejection”
- ▶ Timeline: First week, 1 month, 3-6 months and beyond. Who's coming????? Maybe no one....

# The Anonymous Hacker



## **Symbol of Cybercrime**

The image of a hooded individual at a computer highlights the ongoing threat of cybercrime in the digital era. The electric grid is old, sensitive, poorly protected, and vital to local and national security.

## **Importance of Cybersecurity**

Strong cybersecurity measures are vital to protect sensitive information from hackers who exploit system vulnerabilities.

## **Need for Vigilance**

Staying alert, using strong passwords, “system hardening” and updating software are essential steps to defend against cyber attacks.

# Storm Damage Impact(s)

## **Severe Flooding and Storm Surge**

Storms can cause wind damage, intense flooding, and storm surges, inundating coastal and inland areas, leading to widespread environmental damage.

## **Property Destruction and Power Loss**

High winds and heavy rain from hurricanes and tornadoes can demolish homes, uproot trees, and cause extensive power outages.

## **Long-Term Aftermath**

Communities face economic hardship, displacement, and significant recovery efforts in the aftermath of a hurricane.



# Urban Riots

## Origins of Urban Unrest

Urban riot mobs frequently arise from social strife or political division, sparking collective anger and frustration.

## Consequences of Riots

Riots often cause disruption, property damage, and confrontations with law enforcement, impacting community safety and stability. Potential for martial law.



# Understanding EMP; Starfish Prime



## What is an EMP

An EMP is a sudden burst of electromagnetic energy caused by a thermonuclear explosion occurring at high altitude (20-30 miles), that can disrupt or damage electronic devices and power systems.

## The Starfish Prime Test

In 1962, the Starfish Prime high-altitude nuclear test caused unexpected electrical damage in Hawaii 900 miles away from an EMP effect. The 1962 edition of "[The Effects of Nuclear Weapons](#)" (a key DoD/AEC publication) explicitly described EMP effects, including widespread disruption to power lines and communications.

## National Infrastructure Concerns

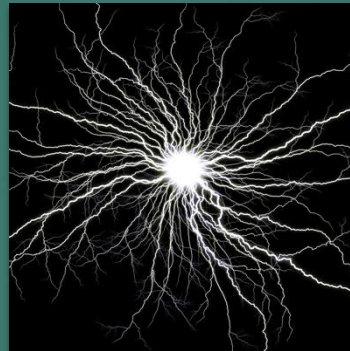
The Starfish Prime event triggered major discussions on the vulnerability of national infrastructure and the need for EMP protection. Since 1962, discussions have been held at the highest levels of government, but to date, no viable civilian survival strategies have been implemented. In other words, YOYO.

# Phases of EMP Discharge: Three Phases



## **E1 Phase: Intense Spike**

The E1 phase is a short, powerful surge that can instantly disrupt or damage electronic devices and circuits.



## **E2 Phase: Lightning-Like Effects**

E2 resembles the effects of lightning strikes, mainly impacting electrical and wiring systems in buildings and infrastructure.



## **E3 Phase: Geomagnetic Storm**

The E3 phase is a slower pulse, capable of causing long-term damage to power grids and infrastructure, like geomagnetic storms. Power lines act as antennas.

# EMP Characteristics; E1

E1 Component (High-Frequency, Fast Transient):

- ▶ Frequency Range: ~10 MHz to 1 GHz (primarily in the radio frequency (RF) and microwave range).
- ▶ Characteristics: The E1 component is a short-duration (nanoseconds), high-amplitude pulse caused by gamma rays interacting with the Earth's atmosphere, producing “**Compton effect**” that generates a rapid electromagnetic field. It has a peak electric field strength on the order of tens of kV/m.
- ▶ Spectral Content: Dominated by high frequencies, with significant energy in the 100 MHz to 1 GHz range, **peaking around 100–300 MHz**
- ▶ **E1 is the most damaging to amateur radio equipment, with antennas designed to capture energy in this frequency range, with damage to semiconductors, and peripherals attached to data cables, etc.**

# EMP Characteristics; E2

E2 Component (Intermediate Frequency):

- ▶ **Frequency Range: ~1 kHz to 10 MHz**
- ▶ Characteristics: The E2 component is similar to lightning-induced electromagnetic fields, lasting from microseconds to milliseconds. It is caused by secondary scattering of gamma rays and neutron interactions.
- ▶ Spectral Content: Contains lower frequencies than E1, with energy spread across the kHz to MHz range, resembling the spectrum of a lightning strike.

# EMP Characteristics; E3

## E3 Component (Low-Frequency, Long-Duration):

- ▶ Frequency Range: ~0.1 Hz to 1 kHz (extremely low frequency, ELF).
- ▶ Characteristics: The E3 component is a slow, quasi-DC pulse lasting seconds to minutes, caused by the distortion of Earth's magnetic field (magnetohydrodynamic effects) and ionospheric currents. It induces geomagnetically induced currents (GICs) in long conductors like power lines.
- ▶ Spectral Content: Dominated by very low frequencies, often below 1 Hz, with a broad, slowly varying waveform.

# DIY Faraday Cage

A simple metal trash can with a non-conductive lining and a tight-fitting lid with conductive lining can protect sensitive electronics from the most damaging frequencies up to the UHF range. Up to 60 dB of attenuation. Can be monitored with a simple SDR receiver, or listening for a signal with a second radio outside the Faraday cage



# No Electric Power; Now what?

- ▶ Immediate concerns:
  - ▶ Potable water - - drinking, bathing, sanitation
  - ▶ Food - - procurement and preservation
  - ▶ Shelter
  - ▶ Health needs, essential medications, handling injury
  - ▶ Sanitation and waste removal
  - ▶ Communication - - among the group and with the outside
  - ▶ Security - -shelter in place or “bug out”; how and where

# Backup electric power

- ▶ Whole home generator: Diesel, propane, natural gas preferred
- ▶ Portable generator: if there is fuel available - - 9-10kW
- ▶ **Whole home solar with LiFePO4 battery backup**
- ▶ Small “solar generator” a small battery bank with solar recharge

Op-sec =operational secrecy/security: what happens when no one else has lights and power except you????

# Portable Residential Generator



## Reliable Backup Power

A 9-10 kW portable generator provides strong backup power for outages or remote locations, ensuring continuous operation for essential devices.

## Compact and Portable Design

The generator's compact build allows for easy transport and quick setup at various sites, increasing convenience and efficiency.

## Versatile and Efficient

Multi-fuel operation (gasoline, propane, syngas) and multiple outlets make this generator suitable for heavy-duty tools, appliances, and emergency use.

# Understanding Gasifiers; Syngas

## Gasification Process

Gasifiers transform solid or liquid fuels into syngas through gasification, enabling versatile energy applications. Charcoal fired are the cleanest, most efficient

## Uses of Syngas

Syngas produced from gasifiers can be used for power generation or heating in various industries.

## Environmental Benefits

Gasifiers help utilize biomass and waste, reducing pollution and supporting sustainable energy solutions.

**Source: Matt Ryder Thrive Off Grid**

<https://www.thriveoffgrid.net/m-3-utility-gasifier> (Gasifiers, charcoal retorts)



# Potable water

- ▶ Drinking, personal hygiene, sanitation
  - ▶ One gallon per person per day; 3 days before death (hypernatremia, seizures) **not pretty**
  - ▶ Personal/community well is best if possible.
  - ▶ Mass storage vs. local procurement (filtration, well)
  - ▶ Collection and purification - - chemical, boiling, filtration, rain collection

# Water Filtration - - Life Straw®



Reliably serves 75-100 school children or others per day or up to 25 people per day in a survival situation for a span of 3-5 years. Doesn't work with salt water. Smaller units are available

# Efficient Rainwater Collection

## Collection System Components

Rainwater harvesting uses gutters, downspouts, and storage tanks to capture and store runoff from roofs efficiently.

## Filtration for Clean Water

Filtration units are used to remove debris, providing cleaner water suitable for irrigation, household purposes, or emergencies. Chemical purification is an alternative.

## Maintenance and Efficiency

Regular maintenance of collection systems ensures maximum efficiency and good water quality for various uses.



# Chemical Water Purification

## Eliminating Harmful Microorganisms

Chemical substances like **chlorine** or **iodine** are used to kill bacteria, viruses, and other microorganisms in water.

## Effective Emergency Solution

Chemical purification is reliable and widely used in emergencies and outdoor activities for safe drinking water.

## Taste and Safety Considerations

Chemicals may alter water taste and require accurate dosing to ensure safety and effectiveness.



# Water Purification: Chlorine based methods

Chlorine compounds release chlorine into water, which kills bacteria, viruses, and some parasites by disrupting their cellular processes. Chlorine also provides residual protection against recontamination.

## Common Forms:

- ▶ Chlorine Tablets: Aquatabs or similar products containing sodium dichloroisocyanurate (NaDCC) are widely used. One tablet typically treats 1-20 liters of water, depending on dosage.
- ▶ Liquid Bleach: Household bleach (unscented, 5-6% sodium hypochlorite) can be used—typically 2-4 drops per liter of water.
- ▶ Chlorine Dioxide: Tablets or drops (e.g., Micropur) are effective against a broader range of pathogens, including Cryptosporidium.
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# Water Purification: Iodine based methods

Iodine kills pathogens by penetrating their cell walls and disrupting metabolic processes. It's commonly used in tablet or liquid form (e.g., Polar Pure or tincture of iodine).

Process:

- ▶ Add iodine (e.g., 2-5 drops of 2% tincture per liter or follow tablet instructions).
- ▶ Stir and wait 30-60 minutes (longer for cold or cloudy water).
- ▶ Optionally, neutralize the taste with ascorbic acid (vitamin C) tablets.

Advantages:

- ▶ Lightweight and compact (ideal for backpacking).
- ▶ Effective against bacteria, viruses, and some parasites.
- ▶ Long shelf life for iodine tablets or crystals.
- ▶ Limitations:
  - ▶ Not recommended for pregnant women, people with thyroid issues, or prolonged use (iodine can be toxic in high doses).

# Example; water purification scenario

If a flood results in tap water contamination, you can take the following steps:

- Filter the cloudy water using a cloth or portable filter to remove sediment.
- Add a chlorine dioxide tablet (like Micropur) to 1 liter of water.
- Wait for 4 hours to ensure effective removal of Cryptosporidium.
- Drink the treated water or keep it in a clean, sanitized container for later use. Or....
- Use a LifeStraw device.



# Shelter, protection from the elements and from others...

- ▶ Heat: wood stove, fire pit
- ▶ Waste and sanitation: garbage, composting toilet, lime pit
- ▶ Animals, insects, vermin
- ▶ Unwanted intruders: thieves, other hungry, desperate people.
- ▶ Staying undetected, Op-Sec

# Shelter: Staying Safe from Weather

## **Protection from Harsh Elements**

Shelters shield people from rain, wind, and extreme temperatures, ensuring safety and comfort outdoors.

## **Simple and Improvised Structures**

Shelters can be simple tents or made using materials found in the environment, offering versatile protection.

## **Ensuring Warmth and Dryness**

Effective shelters help maintain body warmth and dryness, which is crucial in emergencies and outdoor adventures.



# Personal Shelter - - Foil Thermal Blanket

## Efficient Heat Retention

Foil thermal blankets reflect up to 90% of radiant body heat, helping to preserve warmth in cold environments.

## Lightweight and Portable

These blankets are extremely lightweight and compact, making them easy to carry in emergency kits or outdoor gear. **Cost: less than \$10.00**

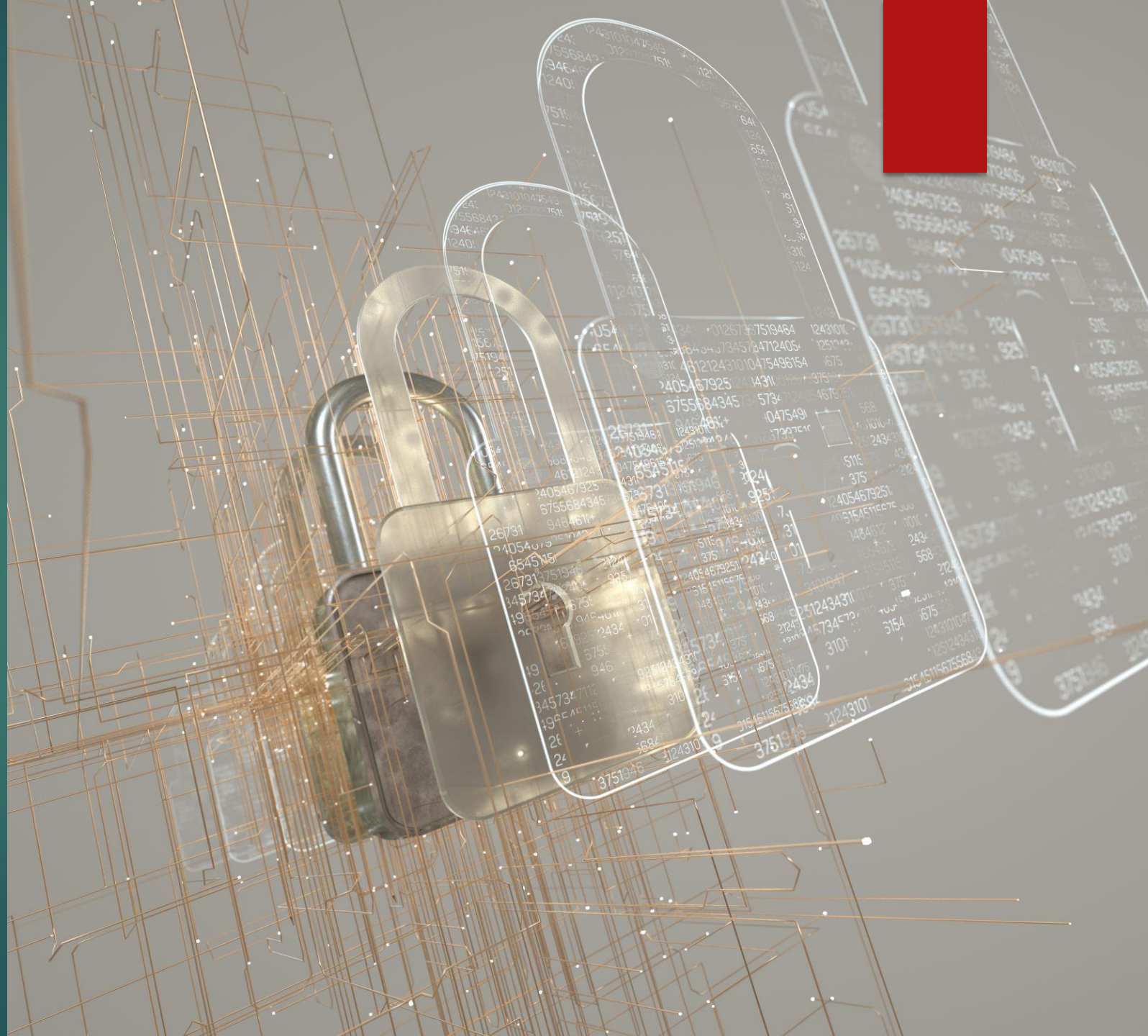
## Protection from Elements

Foil thermal blankets shield users from cold, wind, and rain, reducing exposure and risk of hypothermia during survival situations.



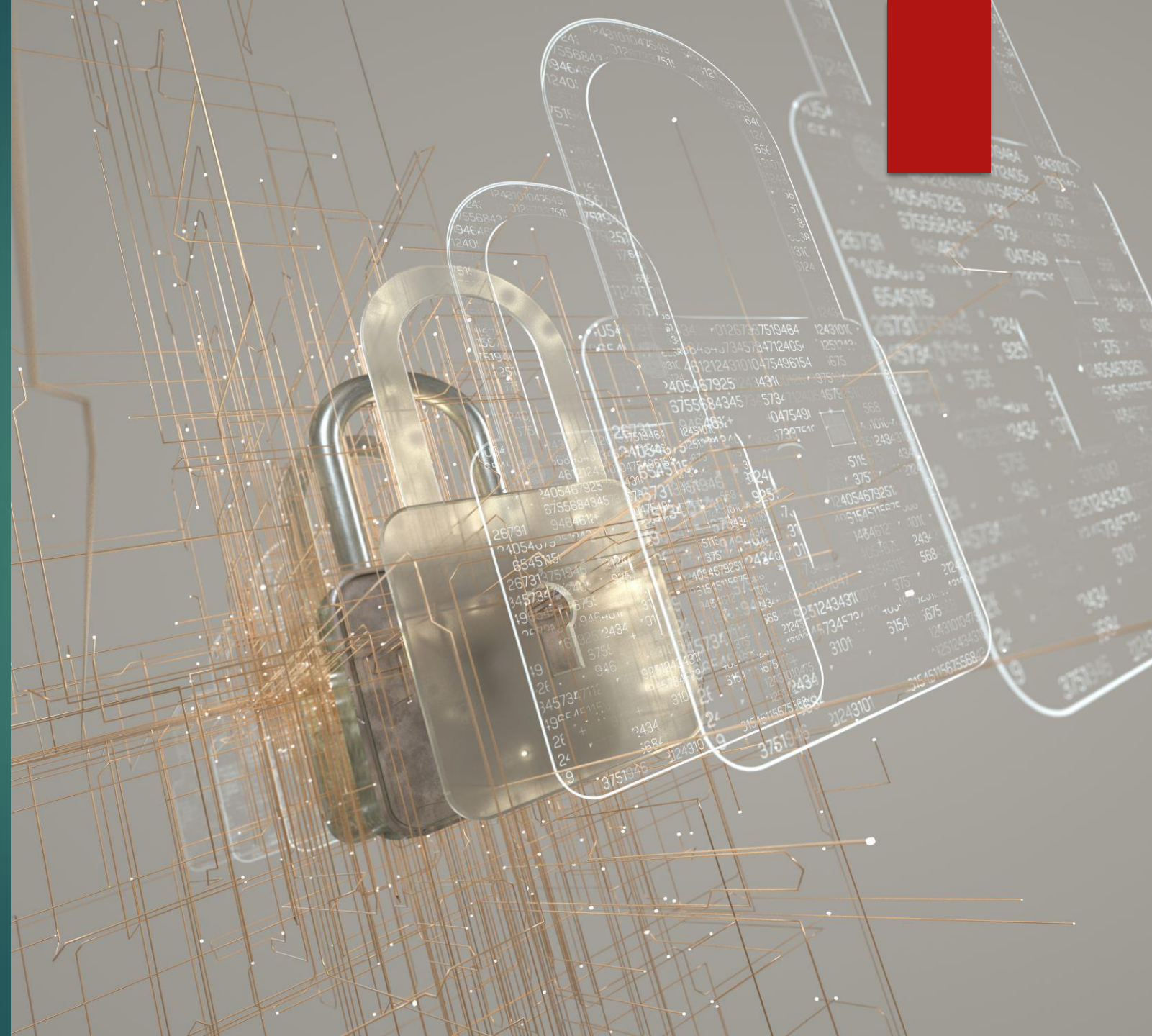
# Protection and security

- ▶ Maintaining a secure perimeter. Cameras, guard watch, etc.
- ▶ Weapons and ammunition: hunting, protection from outside threats, barter.
- ▶ Strength in numbers, assigned tasks (2-4 people is ideal).
- ▶ Shelter in place or “bug out”?
- ▶ Storing sensitive electronics in a “Faraday cage”; how to construct
- ▶ Paper records if possible



# Protection and security

- ▶ How to handle approaching strangers?
- ▶ **Be responsible: When order is restored, you will be held accountable.**
- ▶ Consider using others for the work that needs to be done.
- ▶ Be aware of survivors. Is “networking” possible?
- ▶ Follow your conscience -- the most difficult part. Friend or foe? Do you really have to hurt or kill them?



A photograph of a forest with a large pile of cut logs and a chainsaw lying on top of them. The background shows tall trees and a clear sky. The foreground is dominated by the pile of logs, with a chainsaw's bar and chain visible in the lower right. The image is partially obscured by a dark teal overlay on the right side.

# Tools for Cutting Power

## **Chainsaw Efficiency**

Chainsaws are powerful tools for quickly cutting through wood and large branches, making them ideal for heavy-duty tasks like clearing roads, firewood, rough lumber for building. Keep a spare “igniter” in a Faraday cage for use if necessary.

## **Machete Versatility**

Machetes are versatile tools used for clearing brush, chopping vegetation, and performing various outdoor tasks efficiently.

## **Axe Precision and Durability**

Axes are perfect for splitting wood and felling trees, valued for their precision and long-lasting durability in outdoor use.

# DIY Faraday Cage



## Choosing the Container

A metal trash can serves as an effective base for a simple Faraday cage to protect electronics from electromagnetic pulses.

## Interior Insulation

Lining the interior with non-conductive material, such as cardboard, prevents direct contact between electronics and the metal.

## Sealing for Effectiveness

A tight-fitting lid without gaps ensures EM signals are blocked, maximizing protection for sensitive devices inside the cage.

# Food security: What will you eat???

Must be stable  
without  
refrigeration

Canned  
goods, dry  
grains; freeze  
dried is best

Hunting,  
trapping,  
fishing

Cooking and  
food  
preparation

Sustainable  
sources - -  
seeds, garden

# Freeze Drying



## How Freeze-Drying Works

Freeze drying removes moisture from food, helping preserve nutrients and flavor while greatly extending shelf life. Food is first frozen, then warmed and dried in a vacuum. Process is called sublimation. Water passes from solid to vapor, bypassing the liquid phase.



## Versatile Food Preservation

This method works well for fruits, vegetables, meats, and even full meals, making it suitable for diverse home needs.



## Convenience and Portability

Freeze-dried foods are lightweight and perfect for emergency storage, camping, or daily use, making food preservation easy at home.

# Health needs; staying healthy

- ▶ Essential medications - - 6-month supply. Is refrigeration required (i.e., insulin)?
- ▶ Basic first aid - - bandages, antiseptics, tourniquets.
- ▶ Injuries - - wound care. Infection can be deadly.
- ▶ Dental care
- ▶ Feminine care products, sanitation, vermin.
- ▶ Psychological health, separation from family and friends, fear, panic.





# Communication

- ▶ Among the group - - Two-way radio(s) with charging capability: GMRS, FRS
- ▶ With the outside - - Amateur radio, emergency frequencies, seeking whatever help may be available. NVIS antenna design
- ▶ Solar generator - - 1\$ per watt



# Communication

## Who will you call?

- ▶ Emergency services, fire, police, EOC's; if available
- ▶ Local simplex frequencies:  
VHF: 146.52. UHF: 446.00  
HF: 3.915 (SC SSB net) 3.760, 7.110
- ▶ NVIS antenna design for HF
- ▶ Backup power is essential



# Communication

## Get involved

Support and lobby your congressional representatives to support the bipartisan:

Amateur Radio Emergency

Preparedness Act of 2025 (HR 1094, S 459)

- Addresses HOA covenants, provides a Federal private right of action, irrespective of state or local action.

# Personal checklist

- ▶ Bible
- ▶ Water
- ▶ Food; dry goods, freeze dried, canned goods (check dates)
- ▶ Compostable toilet, shovel, lime
- ▶ Home incinerator, retort
- ▶ Personal meds, aspirin, ibuprofen, bandages, antiseptics, antibiotics
- ▶ Rifle, shotgun, sidearm, ammunition
- ▶ Paper records; property, financial
- ▶ Handheld radio/charger

# Further reading; resources

- ▶ Scott Hunt, "The Practical Preppers Complete Guide to Disaster Preparedness". St. Martin's Press, 2014. Available on Amazon
- ▶ Alexander Cain, "Alive After the Fall". Alexander Cain, publisher, 2020. Available on Amazon
- ▶ William R. Forstchen, "One Second After". Forge Books, 2009. Available on Amazon
- ▶ Practical Preppers website, [www.practicalpreppers.com](http://www.practicalpreppers.com). Water storage and purification, off-grid power, solar, sanitation, Faraday bags
- ▶ Emergency Essentials, [www.beprepared.com](http://www.beprepared.com) . Complete assortment of freeze-dried foods, food storage, equipment.
- ▶ Glasstone, S., & Dolan, P. J. (Eds.). (1962). Third edition, 1977. The effects of nuclear weapons (Rev. ed.). Washington, DC: United States Department of Defense and United States Atomic Energy Commission. Available at: <https://www.osti.gov/servlets/purl/6852629/>



# Further reading; resources

- ▶ Home freeze dryers: <https://harvestright.com/home-freeze-dryers/>
- ▶ ARRL statement on Amateur Radio Emergency Preparedness Act of 2025.  
<https://www.arrl.org/news/view/amateur-radio-emergency-preparedness-act-re-introduced>
- ▶ Report of the Commission to Assess the Threat to the United States from Electromagnetic Pulse (EMP) Attack. 2004.  
Available at  
[http://empcommission.org/docs/empc\\_exec\\_rpt.pdf](http://empcommission.org/docs/empc_exec_rpt.pdf)

