

Search and Rescue and Disaster Gear

Keith Conover, M.D., FACEP

C:\text\asrcmisc\Personal SAR Gear\SAR Gear.doc

Version 4.8 9/16/2011

Winter-only items in **cold blue**, summer-only items in **hot orange**

I. SAR pack (everything in **green goes into disaster pack or duffel for disasters) *check for some items in bike panniers, hanging on inside of coat closet door, or daypack hanging on wall above downstairs landing***

- Belt pouches/hipbelt stuff (often in bag for easy transfer between packs):
 - Left hipbelt pocket (LowePro D-Res 10AW camera pouch)
 - Waterproof notebook and pen
 - 2 granola bars
 - spare AAA disposable lithium cells (2 packs of 3, sealed in plastic) for headlamp
 - Petzl Tikka XP headlight²
 - Right hipbelt pocket (LowePro D-Res 10AW camera pouch)
 - Compass/whistle
 - wrist and head sweatbands
 - contacts saline
 - earbud speaker-mike for Yaesu handheld radio
 - small roll duct tape
 - counting beads:
 - 5 light 1 dark, 5 light 1 dark
 - 10 light on longer string
 - Garmin GPS 60 CSx **Grey pouch** with:
 - belt clip and protective case
 - Garmin 60csx handheld GPS unit with Garmin City Navigator maps for entire continental USA loaded on 2 GB micro-SD card (installed), along with topo/water overlays for SW PA; Spare preformatted micro-SD card with topo maps for

¹ My theory is to keep pretty much everything packed in the SAR pack and then take stuff out of it when heading out—this way I'm less likely to forget something important. I also won't put liquids in my gear unless they are (1) in a Nalgene container, or (2) inside an Aloksak heavy-duty zipper plastic bag. I also color-code everything. I used to think that this was an affectation by some SAR people I know, but from 35 years of SAR experience, I now tend to color code more than I used to. However, I still don't beat Gene Harrison—Bru Randall once went to a costume party wearing a large cardboard box, painted white, with big, wide green-red-green stripes running down it. Everyone immediately knew he was dressed as Gene's refrigerator.

² This replaced a Princeton Tek EOS headlamp, which replaced a Petzl Zipka Plus Headlamp, which replaced a Petzl Zipka headlight. I liked the Zipka because it was so light, and bright enough for quick-and-dirty use, but it wasn't water-resistant at all, the switches tended to corrode over time and required taking the unit apart and cleaning with contact-cleaner and a steel brush. And, the foam pad that kept it from denting your forehead got all sticky and gooey after about a year of use. The Petzl Zipka Plus was a step up: brighter (one more LED, better LEDs), water-resistant, non-corroding switch, non-gooey head pad. But then the Princeton TEC EOS offered a 1-watt Luxeon Start side-emitting LED, which was much brighter and threw a beam farther. But *then* Petzl came out with the Tikka XP, which had a 1-watt Luxeon Star, AND was tiltable to various angles, and includes a diffuser that is an integral part of the light and can be drawn across the front to provide a diffuse area light. It also offers a "boost" option which will, for a few seconds, give you a quite bright beam. And, note: all of these lights use a set of three AAA cells (I use disposable lithium cells from REI), are very small, very light, and all fit in one of these belt pouches with lots of room for other stuff.

Eastern Great Lakes area from Garmin (in battery compartment)

- Garmin GPS accessories:**
 - Quickstart Guide
 - USB cord for Garmin GPS
 - USB extension cord (above not quite long enough to use with laptop in car; can hang on rearview mirror and works well as external USB GPS for laptop)
 - Wrist strap for Garmin GPS
 - Belt clip for Garmin GPS
 - Instructions for Garmin GPS
 - 2 spare alkaline AA cells for Garmin GPS (can't use lithium cells)
- Folding toilet trowel/toilet paper
- Altimeter
- Top Compartment Stuff:**
 - 2-person European-style Pertex Bivouac Sac (Bothy 2 by Terra Nova Equipment) (*take out for disaster response*)
 - 1-Liter Nalgene Water Bottle with duct tape wrapped around it
 - Pack Raincover
 - Small Aloksak plastic bag for wallet, etc.
 - Large Aloksak plastic bag for use as waterproof map case
 - A few fast-food salt packets (for salting drinks in summer)
 - Aloksak plastic bag with
 - Nalgene bottle (60 mL) with sunscreen
 - Nalgene bottle (30 mL) with insect repellent
- Basic Survival/Junk Bag³**
 - Outdoor Research Mesh Cube #4 (outer case)
 - 6 disposable AA lithium cells for radios, and 6 AA alkaline cells for GPS in plastic case
 - disposable AAA lithium cells, for headlamps, 2 sets of three
 - two heavy-duty Aloksak plastic bags sized for wallet
 - Sears ignition pliers
 - half roll of flagging tape
 - 1 packet of Gatorade mix, to make 1 liter
 - water purification tablets (sealed, backup only)
 - plumber's candle melted into 2-oz cylindrical fliptop plastic container
 - 2.5 gallon military-style canteen-liner water bag, in pint freezer Ziploc bag for protection
 - waterproof/windproof matches + striker card in waterproof matchcase
 - tiny stuff, in film can: small bits of thread, 5 assorted-size safety pins, 2 paper clips, 4 small pieces of Radio Shack

³ Always have in pocket: Swisschamp Swiss Army knife with crosscut saw, file, etc.; windproof Windmill lighter; two Photonlights; small lockback knife.

- easy-melt solder, one 8-32x1" bolt with nut and two lockwashers, 2 12-14x1 self-drilling screws
- Lexan spoon
- Aloksak zip-lock plastic bag with
 - Blanket pin
 - package of four single-use tubes of cyanoacrylate glue
 - 1 50' length of Kelty reflective tentcord
 - 1 5-yard roll duct tape (from rei.com)
 - cable ties:
 - 3" – 2
 - releasable 7" – 2
 - mounting-hole type 10" - 2
 - releasable 11" - 2
 - eyeglass repair kit with screwdriver and spare screws
 - 3" strip of kneadable epoxy putty
 - 5 misc. sized needles, in old case for spare mechanical-pencil erasers
- Aloksak zip-lock plastic bag with
 - 3 leaf bags
 - wrist sweatband
 - Fiskars pocket knife sharpener
 - 4 small packets toilet paper, in tiny thin zip plastic bags
 - red cotton bandanna (with leaf bags in protective Ziploc bag)
 - Tiny survival compass
 - magnesium firestarter
- Aloksak zip-lock plastic bag with waterproof notebook, 2 pens and 2 pencils and tiny pencil sharpener
- Aloksak zip-lock plastic bag with
 - tiny bottle contacts solution
 - 30 mL bottle sunscreen
 - 30 mL bottle insect repellent
- Petzl Zipka Plus headlamp with AAA lithium cells
- Extended Survival/Junk Bag**
 - Outdoor Research Mesh Cube #1 (outer case)
 - MSR 700 mL titanium pot with handles
 - pack of tiny playing cards
 - Petzl Zipka Plus headlamp with AAA lithium cells
 - disposable AAA lithium cells, for headlamps, 2 sets of three
 - water purification neutralizing tablets
 - 1 50' length of Kelty reflective tentcord
 - 1 5-yard roll duct tape (from rei.com)
 - disposable AA lithium cells, 8, in hard plastic case from Porter's Camera Store
 - Set of Aloksak tough/light zipper plastic bags
 - Gear Aid Quik Attach Slik Clip Assortment, "one snap lock buckle, one ladder lock buckle and two tri-glide style buckles, all of which can be attached to presewn loops without re-sewing." (www.rei.com)
 - McNett Field Repair Kit: "ultralight seam grip repair kit (seam grip, brush, patches) (www.rei.com, www.mcnett.com)

- 1 roll Gear Aid Tenacious Tape⁴
- 3 ft of 1" flat black pack webbing
- 1 small cordlock
- 1 packet of Gatorade mix, to make 1 liter
- SAR Stuff bag 1:**
 - Goggles etc.:
 - Lightweight goggles (for air operations; clear/tinted interchangeable lenses) and Swim Goggles
 - Lightweight hearing protection (earplugs on lanyard)
 - 1 roll flagging tape
 - Waterproof handheld radio case
 - 3 Surgical masks and small bottle eugenol (oil of cloves) for masking smell of decomposed bodies
 - Plastic signal mirror
- SAR Stuff bag 2:**
 - 2 Orion pocket flares (exp 5/06)
 - 2 Orion 60-second smoke signals (exp 2/07)
 - 2" load strap for litter carries
- Water:**
 - Water Purification Bag:
 - MSR MiOx unit
 - MSR SweetWater Microfilter
 - MSR SweetWater Siltstopper prefilter
 - Platypus Filter Link to attach Microfilter to Platypus collapsible water bottle
 - Platypus 2 liter collapsible water bottle (this and all above available from www.rei.com)
 - Water Purification Accessory Bag (smaller):
 - spare salt (for MSR MiOx water purification device)
 - 4 spare D123 batteries (for MSR MiOx water purification device)
 - spare filter for MSR Sweetwater Siltstopper prefilter
 - Sea to Summit 2.5 gallon (10 L) "Pocket Shower" water bag
 - (1-Liter Nalgene bottle in top section)
 - (2-Liter Camelbak on outside – summer or winter version, depending on season)
- No-cook food, in 1.9L Lock and Lock box**
 - 8 Boomi Bars⁵
 - 2 2-oz. Packs of Stoned Wheat Thins⁶
 - 2 4-oz. Packs of Stoned Wheat Thins
 - 2 4.5 oz cans of mackerel fillets in olive oil
 - Lexan fork
- Warmth:** Thinsulate vest in lightweight dry bag
- Shelter:**
 - Mont-Bell Blizzard Pack compressed disposable sleeping bag
 - Adventure Medical Kits' Thermo-Lite® bivouac sack⁷

⁴ Very light, gets great reviews for permanent field repairs of tents, sleeping bags and the like; will have to see if it works better than the McNett repair kit, above.

⁵ The best fruit-and-nut bars I've found; available from www.amazon.com

⁶ Packaged with an oxygen-absorber in a food-grade plastic bag sealed with a industrial-type heat sealer.

⁷ From www.adventuremedicalkits.com. I used to carry a Space™ Sportsman's Blanket (heavier than the emergency blanket, and has grommets on the corners), folded in half with sticky Velcro stapled along two edges. This could be un-

- GoreTex Pants, Heavy
- Light:** Spare Princeton Tec 4-AA cell halogen light with improvised diffuser and set of spare batteries and spare bulb and Jakstrap headband; also spare batteries (4)
- Vertical gear bag**
 - Petzl seat harness
 - Titanium BMS micro-rack
 - Petzl Frog ascending system with extra quick-attach ascender
- Minimum rescue gear sling in bag**
 - Gear Sling (single-length 1" tied runner)
 - Gloves
 - Single-length sewn runners
 - Double-length sewn runners
 - Prusik loops
 - Locking D rings
 - Non-locking carabiners
 - Small rescue pulley
 - 20' 1" webbing (for improvised seat harness)
 - Emergency one-hand-opening knife with keeper cord
 - Purcell Prusik with locking D-ring and Petzl Basic ascender
- On outside of pack:**
 - ThermaRest ProLite 3 Short inflatable pad in stuffsack
 - GoreTex uniform parka (with balaclava and gloves in pockets)
 - Fluorescent mesh Mountain Rescue safety vest
 - Backpacking Static Emergency Rope: 80' of 5.5mm Blue Water Titan Spectra Cord (20 kN strength but no energy absorption) tied in a rescue coil
 - 2-Liter Camelbak (summer or winter version, depending on season)
- Medical:** WEMSI Personal Wilderness Medical Kit (3 red "First Aid" bags; see official WEMSI kit listing); packed in separate basic REI daypack for "grab and go" availability; also this pack zips to back of big medical kit/REI travel pack.

Velcroed and used as a tarp, or used as is as a quick bivouac shelter. However, this weighs almost a pound, and the Thermo-Lite sack weighs about half as much. There are no grommets on the corners but it wouldn't be hard to tie some shroud line onto the corners, tying around a pebble if needed for strength. The Space Sportsmen's Blanket will fold out flat, and the Thermo-Lite sack is sewed on the bottom and partly up one of the sides—but a pair of Swiss Army Knife scissors could make quick work of this. When I put Velcro on my Space Sportsmen's Blanket, I put it all the way around on the bottom and side, and left the top open. The Thermo-Lite sack is sewn on the bottom and part-way up the side, and has Velcro up the rest of the side and, unlike my prior home-brew, across the top. But the Velcro is intermittent, with ~6" Velcro strips alternating with open areas. I'm not convinced my homebrew was superior, so I'm going to try the Thermo-Lite as is. One criticism of the Thermo-Lite Bivouac sack (at www.backpackergear.com –great place for gear reviews) is that the small mesh vent at the bottom keeps closing when you make random movement, as there is both hook and pile Velcro on either side of it. I put a small piece of non-sticky pile Velcro in the stuffsack with the bivouac sack which should take care of this.

II. SAR Gear Bag (everything in green goes into disaster pack or rolling duffel for disasters)

- Top Section**
 - Radio Chest Harness**⁸ with spare long-duckie dual-band antenna for handheld radio
 - Color code tape
 - Short gaiters (may be in everyday daypack)
 - Long gaiters
 - In Alocsak bag:
 - White shoe polish**
 - 3/4" yellow vinyl tape** for marking on convoy vehicle windows
 - Reflective tape** for marking convoy vehicle back windows⁹
- Small Side Pocket:**
 - aluminum clipboard with storage full of SAR forms, pens
 - Bifocal safety glasses
- Large Side Pocket 1:**
 - Kahtoola MICROspikes** 10
 - Crampons for Limmer Boots**
 - Sorel winter backpacking boots with pac liners and two extra pair of liners and large mesh bag for hanging liners on pack to dry**
 - Spare crampon wrenches**
 - Ski Goggles** (in one of the Sorel boots)
 - Winter hood with rebreathe flap**
 - Winter insulated facemask**
- Side Pocket 2:**
 - JetBoil stove
- Boots:** Limmer custom backpacking boots with boot socks/liners
- 2 Rolls flagging tape**
- Food for Heating/Cooking, in 1.9L Lock and Lock box:**¹¹
 - 4 oz. Quinoa (fast-cooking complete-protein grain)
 - 4 oz. Cous-cous (tiny pasta; just pour in boiling water)
 - 2 pkgs. Hot cocoa mix
 - 4 pkgs. Boullion mix
 - 1 oz. Freeze-dried cooked diced beef
 - 1 Mountain House entrée
 - Lighter for stove
 - 2 Lexan spoons
- Clothing**
 - Polartec Fleece Top and Bottoms (Crestone Alpine Designs)
 - 2 pair dry/clean boot socks/liners
 - Pants Bag:**
 - 2 pr CoolMax underpants (briefs)
 - 1 pr polypro long underwear

⁸ Currently I favor one from The Pouch.

⁹ Trailer DOT reflective-tape Conspicuity Kit from eBay provided cheap source of such strips. In cardboard sleeve to protect them from folding/breaking.

¹⁰ Have tried Yaktrax (good for flat, slide up over the boot toes going uphill or running), Stabilicers (too klunky) and these seem the best all-around "creepers" for nontechnical ice and snow; get great reviews at rei.com.

¹¹ This size available as part of a set from www.amazon.com

- 1 pr artificial-fabric "jogging pants" (LL Bean climbing pants)
- 1 pr Ex-Officio fleece-lined nylon pants
- 1 pr Patagonia shelled Capilene overpants
- Shirt Bag:
 - 1 cotton long-sleeved ASRC uniform shirt
 - 1 cotton ASRC uniform T-shirt
 - 1 Sequel net CoolMax desert shirt
 - 1 zipper-turtleneck mid-weight wicking top
 - 2 Lightweight CoolMax fishnet T-shirts
- Bug suit (mosquito netting)

III. Technical Rescue Bags

A. Kept in vehicle all the time

- Rope:** 100' PMI static rope in rope bag
- etc.

B. Only thrown in as needed

- Rope:** 50 meter dynamic climbing rope
- Technical Gear:** about 50 lbs of misc. climbing and technical rescue gear including three deadmen (can use in mud, e.g., in caves)
- Winter:** three snow pickets, crampons and crampon wrenches in crampon case

IV. Caving Gear

- Misc: Caving Gear**
 - Boots and socks
 - Polypro tops and bottoms
 - Helmet with HDS Systems Actionlight and Princeton Tec lights
 - Coveralls with:
 - gloves
 - waterproof paper, pen, pencil
 - small contacts saline (2)
 - Malden Powerstretch 100 union suit, underpants and CoolMax fishnet and socks
 - Caving necklace (quick-release) with
 - tip cleaner brush
 - small folding knife/screwdriver
 - whistle
 - small compass
 - 2 Photon microlights
- Cave Pack Contents**
 - 500 cc water bottle with duct tape
 - extra food: 4 power bars and some jerky/in bottle
 - thin balaclavas/in bottle
 - thin pile sweater/in dry bag
 - 8 lithium AA cells and iodine water tablets/in bottle
 - hypothermia kit/in bottle:
 - 3 leaf bags
 - candle/in bottle
 - matches/in waterproof case
 - Mg metal firestarter
 - junk incl. 2 Photon microlights/in bottle
 - minimum vertical kit (seat, biner, 2-knot rig)
 - first aid kit
 - SamSplint
 - standard daypack/cavepack first aid kit
 - Swiss Army Knife and mini Leatherman/on lanyard
 - 30' parachute cord

V. Disaster Gear items in red must be added to gear on deployment

- Rolling Duffel** (from basement across from freezer: High Sierra (highsierrasport.com) AT202 36" Drop-Bottom Wheeled Duffel with Backpack Straps, purchased from Cabela's, www.cabelas.com)
 - 1 Outer Pocket (other outer pocket kept free for other items):
 - straps for strapping pack to rolling duffel
 - In Aloksak bag: (add from SAR pack)
 - 60 mL Nalgene bottle of sunblock
 - 60 mL Nalgene bottle of insect repellent
 - In Aloksak bag: (add from SAR Gear Bag)
 - White shoe polish**
 - ¾" yellow vinyl tape** for marking on convoy vehicle windows
 - Reflective tape for marking convoy vehicle back windows (add from SAR Gear Bag)
 - pack lock and multi-luggage cable lock
 - Ziploc bag with multiple small bottles of waterless hand-cleaner
 - ID case for hanging around neck and one for arm
 - Inner pocket (net pocket on bottom of divider):
 - Nalgene bottle with one load's worth dry laundry detergent (and room for more if can scrounge)
 - 10 lightweight clothespins (N.B.: tiny clothesline/pins also found in Austere Toilet Kit)
 - Lightweight nylon dirty-clothes bag (from overnight bag in master bedroom closet)
 - Add (from black bag)
 - into Outdoor Research Clear Pocket #3 zipper bag:
 - medical headlight¹²
 - otoscope/ophthalmoscope and otoscope extras (specula, cures))
 - Broselow pediatric resuscitation measuring tape, laminated pocket cards
 - tools (bandage scissors, Kelly clamps, needlepoint ViseGrips, McGill forceps, FB remover.)
 - Lightweight stethoscope
 - Olympic safety glasses with magnifiers (instead of loupes; add from SAR Gear Bag)
 - Yellow Packing Cube:** uniform tops (2)/trousers (3)
 - Blue Packing Cube:** Uniform Shorts (2) (summer only)/DMAT PA-I uniform T-shirts (4) including black/navy CoolMax fishnets (4) to wear under uniform t-shirts
 - Spare **underwear** (7 pr) and **socks** (7 pr) and **T-shirts** (2), polo shirt (1)¹³, packed in Eagle Creek packing modules and labeled (from overnight bag in bedroom closet/bedroom)
 - Purple **toilet kit** (from overnight bag)
 - black zip-up military **boots** (from vehicle)

- Clothing:** appropriate outer clothes for season and area, khaki Tilley **hat** (from vehicle)
- Electronics:** clear plastic "For Disaster Response" **Computer Misc. Box** Lock and Lock cases (from vehicle)
- Shoe driers** (12V and 110V) (winter only) (from overnight bag in bedroom closet)
- Everyday shoes** (Summer: Teva Sandals, Fall and Spring lowtop walking shoes?, Winter: hightop walking shoes) (from bedroom/bedroom closet)
- Lightweight duffel** for pulling stuff out of duffel to equalize weight or for extra stuff
- Plastic **clipboard** with forms storage, pens
- Sorel **winter boots** and liners (winter only)
- Disaster Pack** (Vaude Ultralight Rock Comfort 35 pack), with emptied internal Camelbak: goes flat into large rolling duffel, with the following equipment planned for it as needed for Strike Team air ops:
 - top pocket**
 - Nalgene 1-liter water bottle (add from SAR Pack)
 - Aloksak plastic bag with (add from SAR Pack)
 - Nalgene bottle (60 mL) with sunscreen
 - Nalgene bottle (30 mL) with insect repellent
 - leather work gloves (Bucket Boss type) with minibiner
 - Building escape kit: 70' of 7 mm nylon rope, in rescue coil, pear-shaped locking carabiner for Mütner hitch rappel, and 10' 1" webbing for diaper seat
 - 4 spare waterproof mini SAR notebooks
 - laminated index of DMAT Pharmacy Cache
 - Garmin GPS 60 CSx belt clip and protective case, and two hipbelt detachable pockets (add from SAR Pack)
 - Back Pocket**
 - Biking Camelbak** (summer only; hanging inside coat closet)
 - Austere Toilet Kit**
 - in separate large net bag for drying: 1 large and 1 small PackTowl
 - in separate large net bag for drying: washcloth made from piece of Packtowl
 - Contacts solution, contacts case, razor, Q-tips, Sea to Summit Travel Soap¹⁴
 - Pocket tissues
 - Tampax¹⁵
 - 2 Travel Bath towels, sealed in bags
 - Toothbrush and paste, floss, flossers, Stimudents
 - Comb
 - track shorts
 - CoolMax tank top
 - 2 REI 1-ounce clotheslines (www.rei.com)

¹² VersaBrite II from Pelican with a Strapit headband; can position light between eyes for seeing into noses, ears, etc.

¹³ All wicking and fast-drying, except the socks; no artificial-fiber socks work as well as wool. Yet.

¹⁴ 50 quick-dissolving leaves of soap suitable for shampoo, soap, laundry soap, dishwashing soap; Replaces 30mL Nalgene bottle of shampoo; saves an ounce of weight. Package inside a 3"x5" heavy-duty ziplock plastic bag to protect against water. From REI.

¹⁵ No, no, not for me—to sell to desperate women. Sometimes worth their weight in gold—well, they don't weight very much, do they?

- Water:** two water purification mesh bags with filter pump and MiOx unit (if not in SAR pack, check daypack or bike panniers)
 - Sea to Summit 2.5 gallon (10 L) "Pocket Shower" water bag (add from SAR Pack)
- Cooking:** MSR multi-fuel stove, new unused fuel bottles, gas siphon
- Food** (3 days' worth if combined with what's in SAR pack) (add two additional Lock and Lock boxes of food from SAR Gear Bag and SAR pack to make 3 days' worth)
 - Freeze-Dried Food:** 2.6L Lock and Lock box¹⁶ with 3 freeze-dried Mountain House or Natural High dinners ("Serves 2" – yeah, if you're not hungry)
 - No-cook food,** in 1.9L Lock and Lock box (from SAR Pack)
 - Extended Food:** 2.6L Lock and Lock box (take out unless known extended austere deployment)
 - 6 1-liter packets of Gatorade mix
 - 2 4-oz. packets of walnuts, sealed (with commercial food bags sealed with a commercial heat-sealer, with oxygen-excluder packets in each)
 - 6 oz. Stoned Wheat Thins sealed in bag
 - 1 lb (6 blocks) of Mainstay compressed emergency food rations¹⁷
- Eating:** Large Alocsac plastic bag with
 - Lexan knife/fork/spoon/soupspoon
 - Orikaso folding cup, plate, bowl¹⁸
 - small mesh bag with small bottle of dishwashing soap and scrubber
- Shelter:** Small tent (orange stuffsack, MSR Hubba) for winter or Hennessy hammock for summer (from back of vehicle)
- Sleeping:** ThermaRest NeoAir sleeping pad (from back of vehicle)
- Sleeping:** Sleeping Bag stuffsack with liners, lumbar pillow and stuffable pillow (in winter, also include auxiliary stuffsack with down booties and overboots) (from back of vehicle)
- Survival/Junk Bags** (two) (from SAR Pack)
- SAR Stuff bag (take out flares/smoke/load strap if traveling by air) (from SAR Pack)
- WEMSI Personal Medical Kits (three red bags in black REI daypack from back of vehicle)
- backup GoreTex jacket (winter only)
- Travel waist pack:**
 - Small (500 mL) Platypus collapsable water bottle: (fill from water fountain once through security at airport)
 - ThermaRest "neck" pillow with eyeshades and earplugs

¹⁶ Available at Target stores; cheap, sturdy enough to be crush resistant (though not so much as an Otter or Pelican box, only a fraction of the weight and bulk), waterproof and airtight.

¹⁷ Take a block, crumble into a cup. Add about a cup and a half of hot water. Stir. Wait for a few minutes. Makes an OK breakfast cereal, especially if you add raisins. Not as good as the old Mainstay rations, which made really good cream of wheat.

¹⁸ This clever "origami" style folding cup and dish/bowl fold flat for storage and are very light and easy to clean. About \$5 each.

- bandannas (2), minibiners (2), elastic straps for head to keep head from flopping around when sleeping sitting up in the back of a C-130
- food: several food bars and some nuts
- small book
- toilet paper in Ziploc bags
- 2 Travel Bath towels, sealed in bags
- Toothpaste and toothbrush
- Waterproof notebook and pen
- 24-hour "ready" pack:** (fluids to remove for air travel highlighted); use Tumi (AlphaTumi T-Pass™ Business Class Briefpack style: 26578) pack, add to it/leave in it:
 - Everyday Emergency Kit** (move EEK buttpack to outside to make more room for stuff inside if needed)
 - Back Top Compartment:**
 - Logitech Anywhere wireless laptop mouse
 - 2 spare lithium AA cells for mouse
 - Sunglasses
 - Back Bottom (small) Compartment:**
 - Spare multipurpose contacts solution: 2.3 mL dropper bottles, 1 8 mL dropper bottle
 - 2 spare pens
 - 2 spare combs
 - hipbelt and sternum strap for pack
 - infrequently-used membership cards
 - spare business cards
 - pen refills
 - bookmarks
 - Back Bottom (big) Compartment:**
 - Lightweight iGo Green power supply (does work for Sony Vaio Z laptop both AC and DC) (add Powerstripsaver, AC cheater, and AC extension cord from on top of books next to Color Laserjet in home office)
 - Glasses case** (Oakley Vault small) with
 - Glasses
 - contacts case
 - Contacts Solution 8 mL dropper bottle
 - Glasses keeper cord
 - Spare laptop battery
 - Ultralight camera (Canon Powershot SD1100 S) in neoprene case with spare battery
 - Spare car key on lanyard attached inside compartment
 - In small pockets inside compartment:
 - Pocket 1:
 - Checkbook
 - Pocket 2:
 - Nail file
 - Highlighter
 - Spare pen
 - Sharpies (1 each small, regular, large)
 - Mechanical pencil
 - Inside-pack "laptop" pouch**
 - thin clear 9x11.5" document file envelopes (3)
 - Grey pouch** with

- Personal meds: Pulmicort, Atrovent and albuterol inhalers, **steroid nasal spray**, Pepcid, cardboard inhaler spacer
- small roll of color code tape
- bit of toilet paper in small plastic bag.
- Sweatband
- Collapsible backscratcher
- ¾" flat black nylon webbing straps with Fastex buckles (for attaching things to lash patches sewed to front of Tumi pack) (2 sets, long and short)
- Heavy-duty Alok sac plastic ziplock plastic bag sized to fit wallet
- Sil-nylon pack raincover (XS, www.granitegear.com)
- Ultralight waterproof/breathable parka (North Face Triumph jacket)
- Light GoreTex pants (Cloudveil www.cloudveil.com)
- Small Mesh bag travel emergency overnight kit: Tiny MSR Packtowl Personal, Sea to Summit Pocket Body Wash¹⁹, CoolMax underpants, light CoolMax fishnet T-shirt, pr. wool socks. (Already have toothbrush, toothpaste, contacts solution and combs in other pockets of pack.)
- Disaster Toolkit:**
 - Screwdrivers and sockets:²⁰
 - Husky 8-in-1 Precision Screwdriver Set²¹
 - Screwdriver/socket bit set and driver²²
 - Lutz 2-in-1 Phillips #1 and 5-6 (3/16") slotted screwdriver²³
 - Small Channel-lock pliers
 - Leatherman Squirt E4 electronics tool (with wire stripper, with knife broken off to pass TSA security for flying)
 - Radio Shack contact cleaner pen
 - Radio Shack pocket digital multimeter
 - Lightweight magnifiers: Model CO5: 2.5x 8" focal distance, from Donegan Optical Company²⁴

- cable ties:
 - 4 - 2"
 - 2 - 4"
 - 2 - 8" (with mounting hole at end)
 - 2 - 10"
 - 2 - 15.5" releasable
- Self-drilling screws:²⁵
 - 4 - 12-14x1"
 - 4 - 10-16x1.5"
- 4 tiny strips Radio Shack easy-melt solder
- Miniature sewing kit (1 ounce)
- 2 - tampons, in Alok sac plastic bag
- 2 safety pins
- Outside the "laptop pouch" but inside the laptop compartment:**
 - laptop
- Right side compartment:** pouch with
 - Various Hospital IDs and clip for FEMA/DMAT IDs (IDs in wallet)
 - Oral B Travel Toothbrush and small toothpaste**
 - Grey "computer" pouch with
 - iGo powerXtender Battery Operated Charger (will recharge cellphone from AA cells) with A97 micro-USB tip
 - iGo tips for above and other iGo chargers, 10 misc tips
 - Solio Classic Solar Charger/Battery (charged up already via USB)
 - Solio USB charging cables:
 - USB-Solio for charging Solio
 - Solio-iGo with A97 micro-USB tip for charging cellphone
 - Ultrapod micro camera tripod with nylon ¼-20 bolt to position solar charger
 - iGo laptop charger DC cigarette-lighter cord
 - iGo cigarette-lighter DC charger adapter for cellphones with A97 micro-USB tip
 - AC-USB power adapter
 - 1 short USB-micro-USB cable
 - ZipLinq RJ-45 cable
 - iGo 1 -> 2 tips adapter
 - micro-USB 1 -> 2 adapter
 - USB-iGo tip adapter cord
 - 2 GB thumb drive for laptop backup (also keep 8 GB USB keys on keychain)
 - micro-mini-standard SD card adapter set
 - 1/4 of a microfiber lens cleaning towel; for cleaning glasses, camera, laptop)
 - small Windex bottle for cleaning laptop screen**
 - 1 3mL bottle of dried habanero pepper (for boring food)
 - Left side compartment:** with radio equipment:
 - Field-programmable amateur handheld VHF/UHF radio (Yaesu FT-60R) loaded with empty AA cell battery pack
 - extra antennas
 - cells (6 lithiums, 6 alkalines)

¹⁹ 50 quick-dissolving leaves of soap suitable for shampoo, soap, laundry soap, dishwashing soap; Replaces 30mL Nalgene bottle of shampoo; saves an ounce of weight. Package inside a 3"x5" heavy-duty ziplock plastic bag to protect against water.

²⁰ At under a pound, this tool set has small and large screwdrivers including Torx and Allen, and ¼"-3/4" and 7-19mm sockets with a ratchet driver.

²¹ Overall lighter and smaller than similar offerings from Sears and Kronus; approx. 1.5 ounce. with following bits, some from a separate 8-in-1 Torx version of the same screwdriver set): Slotted 1/16", 5/64", 3/32", 1/8" (1-2); Phillips #000, #00, #0, #1; Torx T4, T5, T6, T7, T8, T9, T10, T15.

²² Sears Craftsman 947483 Magnetic 32-piece Screwdriver Set, selected bits only: slotted 3-4 (5/32"), 8-10 (1/4"), 12-14 (3/8"), 14-16 (29/64"); Phillips #2, #3; Torx T20, T25; Hex (Allen) 5/64", 3/32", 7/64", 1/8", 9/64", 5/32", 3/16"; ¼" hex to ¼" square adapter. Craftsman handle at > 7" is too long for airplane carry-on luggage per the TSA, so replaced with a (short) Task Force 7-Piece Multi Bit Screwdriver Item #:307991, Model: 53905 from Lowe's for \$2; all the bits fit in the handle if you unscrew and take out the little bit clip in there; also a 2" magnetic bit driver that extends this stubby screwdriver to full length. Also added Neiko pocket ¼" ratchet driver, 3/8" to hex adapter, and Gator Grip ETC-200MO Universal Socket ¼"-3/4" and 7-19mm. Total weight ~11 oz.

²³ Long thin shaft for recessed screws; wt. 1 ounce.

²⁴ Will work by themselves or can be clipped to glasses; 4 ounces including separate protective cases for glasses-frame part and magnifier part.

²⁵ Gator Grip socket

- extra empty 12-cell AA case (can usually buy and fill with AA cells locally)
- Bag with:
 - auto power adapter
 - clip-on external auto antenna BNC mount
 - BNC > SMA and SMA > BNC adapters
- Main Compartment**
 - Everyday Emergency Kit/buttpack (see separate listing)
 - Shoulder strap and backpack straps for everyday emergency kit buttpack
 - Spare small sil-nylon stuffsack
 - luggage tag
 - Laptop sunscreen (add from car or elsewhere)
 - travel documents

VI. Miscellaneous Gear Bag²⁶

- Light:**
 - Eveready fluorescent D-cell lantern with lithium cells
- Water:**
 - 3 1-liter bottles (full)
 - MSR water bag if not on pack
 - Backpacking PUR water filter (superseded by small filter/MiOx unit)
 - Extra canisters for backpacking water filter
 - Empty 2.5 gal water bag and bladder
 - Seattle Sports folding bucket and basin
 - Sea to Ski Pocket Shower
- Shelter:**
 - Disposable compressed sleeping bag
 - Roll of leaf bags
 - Wad of smaller trash bags
- Clothing:**
 - Small size Pack Towel
 - Old Goretex parka/pants
 - Spare nylon pants
 - Bag with spare gear:
 - 2 wool balaclavas
 - 1 pair wool mittens
 - 2 pair brown fleece gloves
 - pair wool socks and liner socks
 - leather gloves
 - cheap compass and 2 whistles
 - spare goggles
- Food (in mouse-resistant boxes):**
 - MRE/Fireline Meals: 4
 - MRE heaters: 3
 - Can of dried greens: 1
 - Granola bars: 1 box
 - Bacon bits: 1 small can
 - Survival (cream of wheat) bars: 1 package
 - Quick-cook dried veggie meals: 3
 - Lexan lunchbox: 1
- Stove accessories:**
 - Windscreen
 - Base
 - Extra fuel canisters (1 small, 1 large)
 - Large Pots, potscrubber and detergent
 - Cups and plates and utensils (2 each)
- Tools etc:**
 - Spare set of Aloksak zipper plastic bags
 - Folding saw
 - Survival knife
 - Magnifiers
 - Solar Still
 - Daypack
 - Frisbee

²⁶ Miscellaneous Bag, SAR Gear Bag, Caving Gear Bag, and Technical Rescue Bag are Patagonia boot/duffel bags, circa 1990, which I don't see in the catalog any more. Uniform size and shape makes packing the back of the truck easier. Each is labeled with a 3x5" laminated tag with the name of the bag on the front, and my name/color code/contact information and a brief contents on the back, attached via a 2" Versalink type ketchchain put through a brass grommet on the tag and then around a zipper pull; similar tags on the SAR pack, tool kit, etc.

- Cards
- Organic vapor respirator
- 10' 1" flat black pack webbing
- 1" black nylon pack webbing hardware: 2 ladderlocks, 2 triglides, 1 adjustable buckle, 2 D rings
- 2" adjustable buckle and 2 2" triglides
- 1 cordlock
- 1 Zipper Repair Kit (www.rei.com)

VII. Items Loose in truck (everything in green goes into disaster pack/duffel for disasters; add items in red)²⁷

- laptop sunscreen** (usually to the left of the front passenger seat)
- Computer Misc. Box** (note: two USB keys, one 512MB and one 2 GB, on personal keychain; have two so that there is a second backup for robustness/redundancy/sharing)
 - CD-Rs (2) and DVD-Rs (4) in thin cases and small and large Sharpie for marking
 - 2 - Modem cords with female-female adapters
 - USB printer cable
 - adjustable-angle female>male USB adapter
 - lightweight USB 1 > 4 hub and AC power supply
 - Micro-SD>SD card adapter
 - FT-60 USB handheld radio programming cord (www.usb2ttl.com) and cloning cord
 - Sandisk Imagemate 5 in 1 photo card USB adapter (add from desk, USB cord's already in the box)
 - 1 short Monster 1->3 extension cord
 - Powerstripsaver
 - 1->3 AC adapter
- Car Laptop/GPS Travel kit**
 - Cellphone vehicle suction-cup mounting kit with 2 mL squeeze bottle Windex and lightload compressed towel for cleaning windshield for mount (add actual mount from small car)
- S Radios:** 4 cheap FRS radios with spare AA alkalines
- Charcoal Vest** HeatPac hypothermia rewarming device with 18 hours of fuel in Pelican box
- Mini-Opskit** (in a file box)
 - Equipment**
 - File Case with label on outside
 - File Case insert, slide-in style, with
 - 2 sets of dry-erase colored markers
 - 2 sets of colored highlighters
 - several pens
 - roll of 2" clear adhesive tape
 - Canine Resource Capabilities Summary forms
 - File Case insert, flip-open style, with
 - 2 Scotch tape dispensers
 - 1 small roll KC color code tape

- paper clips
- 1 pr. Scissors
- 1 stapler
- spare staples
- mini-grid overlays
- protractor
- Canon i80 color inkjet printer with
 - USB cord
 - Power adapter
 - spare ink cartridges
 - blank paper (~75sheets)
- Extension cord, 30'
- Powerstrip Saver
- 2 > 3 prong power adapter
- 1 > 3 3-prong adapter
- Maptech CDs for VA, WV, MD, PA (part of Ohio)
- Mission Folder Set:** Two Sets of Five Master Folders for search:
 - General File
 - Area Poster Signs: Staging Area, Operations, Sign-In, Commo
 - Daily Form #1: Command Log (4 sheets)
 - Daily Form #2: Table of Organization (1)
 - Daily Form #3: SAR Unit Personnel Register (4 sheets)
 - Daily Form #4: Local Volunteer Personnel Register (4 sheets)
 - Daily Form #5: Vehicle Register (4 sheets)
 - Daily Form #6: on Tasks Completed Folder (1)
 - Daily Form #7: on Tasks in Progress Folder (1)
 - Daily Form #8: Communications Log (4 sheets)
 - Daily Form #9: SAR Resources Worksheet (1)
 - Incident Form #1: Missing Person Questionnaire (1)
 - Incident Form #2: Incident Objectives (1)
 - Incident Form #3: Medical/Evacuation Plan (1)
 - Incident Form #4: Communications Plan (1)
 - Tasks to be Done (with 10 Task Assignment Forms, dual stapled forms, ready for carbon paper)
 - Tasks in Progress (with Daily Form #7: Clue Log attached to front)
 - Tasks Completed (with Daily Form #6: Task Log attached to front)
 - Tasks Not Done
- Other Folders**
 - Folder: Transparency Masters (20)
 - Folder: Grid Overlays (3 each of clear in vertical and horizontal, and one of both vertical and horizontal in green, yellow, red, blue)
 - Folder: Carbon Paper
 - Folder: Transparency Masters (for copier)
 - Folder: blank paper (for copier) (about 100 sheets)
 - Folder: Searcher Information Sheets (about 20)
 - Folder: Essential Documents
 - Pennsylvania State Highway Map
 - Pennsylvania USGS Topographic Map Index

²⁷ Truck is a beat-up 1988 Range Rover with a variety of additions, including a newer 3.9 L V8 engine, ARB bar on the front with extra Hella lights, and a 9000-lb Warn electrical winch, skid plates and tow points underneath, a Odyssey primary and Optima yellow-top deep-discharge secondary battery with a Husky isolator, and a Jottodesk with an integrated iGo Juice power supply for my laptop, and an iGPS USB GPS permanently installed on the roof with the USB cable sticking out of the dash near the Jottodesk, a VHF/UHF mobile radio, and a 12V charger for my Yaesu FT-60 handheld.

- ICS Field Operations Guide (ICS-420-1)
- Search is an Emergency Field Coordinator's Guide
- Folder: Originals to Photocopy (PSARC Forms Packet, PSARC Grid Overlay)
- Folder: Spare Forms
- Folder: Cave Rescue Forms
 - ER-NCRC Level of Urgency Chart (1)
 - Personnel Log (1)
 - Communications Log (1)
 - Entrance Control Log (1)
 - Equipment Log (1)
 - Rescue Event Log (1)
 - Lost Person Questionnaire/Checklist
 - Mission Personnel Register (1)
 - Medical Assessment Flow Sheet (1)
 - Mini-Information Form (1)
 - ER-NCRC Task Assignment Form, double, with carbon paper (10)
- Spare Folders (10)
- Helmet** with 2 lights (HDS Systems ActionLight III on order to replace old ActionLight I; Princeton Tec 4-AA cell halogen flashlight with improvised diffuser mounted to helmet with mounting-style cable ties)
- Hanging Clothes/etc.:**
 - Tilley hat (add to Tumi Pack for disasters)**
 - Best GoreTex Parka (Marmot Glenmore) with hat, facemask and gloves
 - Powerstretch fleece pullover (LL Bean)
 - Thick fleece jacket (Lowe)
 - Fleece stretch tights (Lowe)
 - Softshell jacket (Cloudveil Serendipity) with Cloudveil hat, facemask and winter gloves
 - Primaloft vest (Cloudveil Enclosure)
 - Expedition down parka and pants and mittens (for standing around for long periods in cold weather)
 - ASRC Uniform Shirts:
 - Short-sleeve cotton shirt
 - Long-sleeve cotton shirt
 - Long-sleeve CoolMax shirt
 - Long-Sleeve lightweight polyester fleece/chamois shirt
 - Large Mountainsmith lumbar pack** ("Cairn"²⁸) with two full 750 mL water bottles, spare LED headlamp, spare flagging tape, Water bottle/water bottle belt pouch (contents for quick access while driving; pack for short warm-weather tasks with Everyday Emergency Kit from everyday pack instead of most of SAR gear)
 - DMAT uniform** for local deployment
 - team t-shirt
 - uniform blouse

- uniform pants/belt
- team hat
- below hanging clothes: combat-type boots with zip-up inserts (summer Danner Striker GoreTex boots or winter Matterhorn ATD insulated boots, depending) with two pair Rohner brown trekking wool socks (add to Disaster Duffel)
- DMAT/SAR Base Buttpack:** on separate hanger: large buttpack²⁹ for local deployments with
 - laptop computer sun visor
 - big Aloksak plastic bag (for laptop computer when it's raining)
 - big goggles
 - hearing protectors
 - leather work gloves (Bucket Boss type) with minibiner
 - bag of flagging tape
 - small bottle of waterless handcleaner
 - neck lanyard/ID holder
 - PolarWrap sport rebreathe flap
 - 2 water bottles full of water in side pockets, and one bottle full of water in separate belt pouch
- Sleeping bag stuffsack**
 - Sleeping bag (3-season or winter: Western Mountaineering down bag)
 - Polypro liner
 - Silk liner
 - ThermaRest Stuffable pillow
 - ThermaRest Lumbar pillow
 - Extra stuffsack with:
 - Down booties
 - Overboots for staggering around in deep snow in down booties
- ThermaRest ProLite 4 Regular** inflatable pad in stuffsack (Stuff Sack TL R: heavier than official ProLite 4 stuffsack but better for attaching to pack) with repair kit in bottom of stuffsack
- MSR Hubba one-person tent and Hennessy Backpacker Asym Ultralight hammock** with extra screw-eyes to mount on buildings, Kelty Triptease Lightline (www.kelty.com) as high-visibility replacement for rainfly pullouts, and added Lazr Hi-Vis titanium tent stakes from Bozeman Mountain Works (www.backpackinglight.com)³⁰

²⁸ The Cairn model is big enough to fit both the Everyday Emergency Kit small buttpack (which is almost always with me) and a laptop computer along with a few other things. Handy for carrying at a base somewhere—especially when you don't want to leave your laptop laying about. Yes, you could use a daypack, but a lumbar pack is a lot easier to manage when you're taking it off and putting it on over and over. Also, the lumbar pack with the Everyday Emergency Kit and a couple of other items from the SAR pack makes a dandy pack for a short SAR task in warm weather.

²⁹ Mountainsmith Cairn: large enough to carry Everyday Emergency Kit, laptop, and certain additional items; quite useful when doing management tasks but must be able to respond immediately to any sort of medical emergency.

³⁰ If you browse any of the Internet information on backpacking hammocks, you'll see that these hammocks, though expensive, are the darling of ultralight backpackers. Once you figure it out, you can set it up in under 3 minutes, as long as you have two somethings (trees, telephone poles, road signs, etc.) on which to tie the ends of the cords. Having a couple of tie-outs to either side is also very helpful. You can put it in places where there is neither room nor any flat place without rocks to pitch even a 1-person tent. An open cell pad to insulate underneath can replace your ThermaRest pad—but, due to concerns about the open-cell foam getting wet, and about not being able to use it if you pitch the hammock as a tent, I've given up on this and just use a ThermaRest instead. Although it can be pitched as a tent, the open cell pad won't work as insulation this way, and you need a couple of stakes and something to use as a pole. A quick and handy shelter wherein to sleep for a few hours for when you're in a hurry—I also lived in it for about two weeks when deployed with a Disaster Medical Assistance Team team—much nicer than being in the big tent.

- Army blanket to cover everything
- Tracking stick (old bamboo XC ski pole without basket but with rubber bands)
- Flotation vest and polypro throw rope in bag
- Spare VHF/UHF ham handheld radio (Yaesu FT-60)
- Ice Axe
- Ski Poles *or walking poles*
- MSR Snowshoes
- Old down parka (stuffed)
- Vehicle Equipment³¹
 - Jottodesk, connected to GPS mounted on roof, with iGo 12V power supply for laptop; also with iGo DualPower accessory with A43 tip for charging cellphone
 - VHF/UHF/ham mobile radio
 - 12V/AC charger for FT-60 handhelds/batteries
 - Misc maps (including spare highway maps to give away)
 - Spare Versabrite II headlights (2) mounted on sun visors
 - Glove compartment:
 - Velcroed to inside of top lid
 - Kleenex
 - Tire gauge
 - Rack keys
 - Utility scissors (Fiskars serrated kitchen scissors)
 - Left Front
 - Paper towels
 - Hand sanitizer
 - 3 GoJo hand cleaner towels, individual packets
 - Lens cleaner cloth
 - Contact cleaner pen (for cellphone handsfree kit, etc.)
 - Left Middle
 - Chewable ASA 81 mg tablets
 - Chewable Pepcid tablets
 - Emergency Backup Binky
 - Hair rubber bands
 - Left Back
 - Headlamp
 - Monocular
 - 4 spare AA lithium cells and 4 spare AAA lithium cells
 - roll of quarters (for tolls)
 - Right Front
 - Reflective Mountain Rescue safety vest
 - Right Middle
 - Glass signal mirror
 - 4 pair nitrile exam gloves
 - CPR shield
 - Cat Crap lens treatment
 - Antenna cap
 - Small hearing protectors (earplugs)

- Right Back
 - Swisstool “Leatherman” tool
 - Swisschamp swiss army knife
 - Supertape
 - Small roll duct tape
 - 6’ measuring tape
 - small reversible screwdriver
 - Sharpie marking pen
 - Type 13 Anti-Seize (for antenna mounts, etc.)
- On mirror/visor: Sunglasses and spare sunglasses
- Under seat:
 - Small inverter
 - 110V adapter for handheld radio charger (can be demounted from vehicle then plugged in to 110V)
- Behind seats in pockets
 - Vehicle maintenance records; ham repeater atlases/maps; reference manuals for stereo, VHF radio, etc.
 - Toys for kids to entertain themselves with so they don’t destroy the car
 - Common atlases of the area
 - Windex
 - Large umbrella
 - Inflatable Travel Pillows (2; for naps along the road)
 - Sun visor for laptop
- In bag hanging from armrest:
 - Extra Teaching Company CDs (for those long drives—best way to stay awake: www.teachco.com)
- Attached to back of back seats³²
 - Large truck-style cross lug wrench³³
 - Snow brush/scrapper
 - squeegee/window scrubber
 - Life-Link snow shovel
- Spare high-gain 2m/VHF antenna (have antenna mount on roof, used mostly only when vehicle stationary)
- Canvas grocery bags/cotton produce bags and Nalgene bottles for bringing home olives in brine, smoothies, etc.
- Large Medical Pack (REI travel pack; not currently indexed, but full of lots of medical stuff, believe me)
- Attached to inside of tailgate: Hi-Lift 48” jack with attachments and instructions
- Set of hand extrication tools, etc.
 - leaf spring tool (handmade, for cutting)
 - hand sledge hammer
 - hatchet
 - 2 titanium pry bars
 - bolt cutters
 - mini-KT-bar (extrication/wrecking tool)
 - 1970s-era Air Force aluminum survival tool with hatchet, shovel, saw
 - 12-V tire pump
 - Large base for Hi-Lift Jack
- Optional (only added when actually going out for trail maintenance, or if known downed trees from a storm):

³¹ Vehicle is a 1988 Range Rover, a bit beat up, with an ARB bar and 9000-lb Warn winch on the front, extra offroad lights on the ARB bar, two batteries with an isolator, an external spare tire carrier, Thule bike rack on the back and Thule roof rack with bike racks and a canoe/Stokes litter rack attached to it.

³² Attached using standard hardware-store spring clamps, attached with self-drilling screws.

³³ Range Rovers have large tires and require a truck-sized lug wrench.

- Set of trail construction/maintenance tools on heavy leather tool belt/tool pouches
 - Woodsman's Pal machete/brush hook
 - Pocket folding loppers (Lee Valley Garden Supply)
 - Buck lightweight pruning shears (www.sarcamp.com)
 - Folding SvenSaw
 - Single-bitted axe in aluminum sheath (sheath from Madsen Logging Supply)
 - Glock entrenching tool³⁴
- Stihl Chainsaw
- Ryobi Weedwhacker
- Gas and oil for above
- 10-lb sledge
- Grass whips (2)
- Non-folding loppers
- Large shovel with cutting edge
- Large vehicle Tool Kit
 - Electronics Tools
 - Soldering Irons: 12V, 110V, butane (with lighter-style butane refill tank)
 - Small solder (including low-melting-point solder strips, work with lighter)
 - Misc RF adapters (BNC, PL-259, TNC, SMA)
 - BNC coax patch cables with BNC M/M
 - Pocket multimeter with spare batteries
 - Wire crimper/stripper
 - Electrical Equipment
 - Continuity tester
 - AC extension cord
 - Pocket AC circuit tester
 - Roll of electrical tape
 - car fuses (many kinds and ratings) and fuse puller
 - Light socket to AC adapter
 - Radio Shack Leatherman Squirt EL mini tool (with wire stripper, etc.)
 - Nippers
 - Hand Tools
 - Large and small Vise-grips
 - Sears Craftsman ignition pliers (small)
 - Alltrade needlenose/standard pliers combination
 - Heavy-duty scissors
 - Wrenches (all Sears Craftsman except as noted)
 - Large and small crescent wrenches
 - Adjustable box-end wrench
 - Metric and SAE-Imperial hex key sets, folding
 - Metric wrenches in rolled case:
 - combination wrench set: 8mm-16mm
 - box-end wrench set: 6mm-18mm
 - ignition wrench set: 4mm-11mm
 - SAE-Imperial wrenches in rolled case:
 - combination wrench set: 3/8"-11/16"
 - ignition wrench set: 13/64"-3/8"

- Socket/hex tools (sockets on Craftsman racks):
 - AmPro stubby 1/4"-3/8" ratchet handle
 - Skewdriver® offset hex handle
 - generic hex screwdriver-style ratchet driver with set of bits in handle
 - 6" long hex Phillips screwdriver tip (for deeply-inset screws)
 - 1/4" ratchet handle
 - 1/4" screwdriver-style handle driver
 - 1/4" 3" extension
 - 1/4" 3" flexible extension
 - 1/4"/hex finger-wheel driver
 - 1/4" metric sockets, 5-6-7-8-9mm
 - 1/4" SAE-Imperial deep socket set, 1/4"-1/2"
 - 3/8" 2.5" and 6" extensions
 - 3/8" metric deep socket set, 10-19mm
 - 3/8" metric/SAE-Imperial combination socket set: 3/8"-10mm to 7/8"-22mm, also 12, 18 & 24mm
 - 1/2" drive ratchet handle with extra sockets in handle
 - 1/4" drive ratchet handle with extra sockets in handle
 - 1/2" drive 24 mm socket
 - 1/2" drive spark plug socket
 - 1/2" to 3/8" and 3/8" to 1/4" adapters, each both ways
- Small reversible Philips/standard screwdriver
- Craftsman small long screwdrivers, standard and Philips
- Offset standard and Phillips screwdrivers
- Set of 4 small Phillips screwdrivers
- Jeweler's screwdriver and nutdriver sets
- Stubby Philips and standard screwdrivers
- Mini-hacksaw and extra blades
- Type 13 Anti-Seize lubricant in tube
- Mini-pry bars (2)
- Spare batteries: 9V (2: lithium), AA (8: lithium), AAA (6), C (4) D (2)
- Spare mag-mount 2m/VHF antenna
- Large and small cleaning brushes, and battery-terminal brush
- spare roll of color code tape
- duct tape
- Card stock and sheet protectors and Sharpie marker for posting signs
- Aluminum coathanger
- Thin steel wire
- Plastic kitchen trash bag
- Nuts, bolts, screws, nails, cable ties, spare wire, rubber bands, electrical terminals, small Bunji cords, thumbtacks, packets of epoxy glue,
- Red shop towels
- GoJo hand cleaner towels, individual packets, and paper towels
- Heavy work gloves
- Winch Tool Kit

³⁴ Lighter and stronger and better built than all others I've tried.

- 2 Aluminum adjustable jack stands (3 ton)
- 2 folding tire chocks
- Jump cable bag (Duluth Trading Co. Deluxe Jumper Cable Bag)
 - Heavy-duty jump cables
 - Work gloves (Bucket Boss)
 - Gunk pressurized can of tire sealer/inflator
 - Disposable coveralls
 - folding cross lug wrenches, Imperial and Metric (for other cars)
- Fire extinguisher
- Spare tire on back
- Bag of straps for roof rack
- Bundle of road flares
- Box of triage tags
- Needle disposal box
- Bag of reflective Mountain Rescue safety vests
- Mag-mount rotating light with yellow/blue/red lenses³⁵
- Jar of cat litter (for traction)
- Copper ice scrapers (2)

³⁵ For different jurisdictions, as needed; like yellow the best, especially for stopping along the roadside, as people don't get as excited and don't do as many stupid things as when they see a red or blue light.