

# Badwater

Ultramarathon

...a good comfortable road...



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*Kiehl's*  
SINCE 1851

# Badwater Ultramarathon

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S I N C E 1 8 5 1

Kiehl's Since 1851 is proud to serve as title sponsor of the 2003 Badwater Ultramarathon. We are most honored to support the heroic men and women who have committed themselves to participating in this year's event.

Kiehl's was founded as an old-world apothecary at the corner of Thirteenth Street and Third Avenue in New York City. Its unique and extensive background represents a blend of cosmetic, pharmaceutical, herbal, and medicinal knowledge developed and passed on through generations. For more than 150 years, Kiehl's has served its customers skin and hair care products formulated with the finest ingredients. The company is characterized by a strident commitment to service standards of the highest quality.

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**MattFrederickDesign.com:** Webcast, race magazine, creative design

**Mediablend.com:** Online store, web hosting, race logo

**Powerbook1.com:** Mac computers, hardware, webcast support

**Badwaterbenjones.com:** Training Clinic hosts

### Local Support

**Death Valley National Park**

Visitor's Center

Pre-Race Meeting

**Furnace Creek Inn and Ranch Resort**

Start Line and Race HQ Hotel Host

**Panamint Springs Resort**

[www.deathvalley.com](http://www.deathvalley.com)

Mile 72 hospitality suite

**Whitney Portal Store**

Finish Line Hosts

"Ask for the BIG pancake"

**Dow Villa, Lone Pine**

Finish Line and Race HQ Host Hotel

**Joseph's Bi-Rite, Lone Pine**

Post-Race Get Together Food

**Pizza Factory, Lone Pine**

Post-Race Get Together Food

**Lo-Inyo Elementary School**

Post-Race Get-Together Location

**Alliant Food Services**

Post-Race Breakfast Food

**Seasons Restaurant, Lone Pine**

Post-Race Breakfast Hosts

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**adventureCORPS™**  
 "We're Out There"



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**[www.badwaterultra.com](http://www.badwaterultra.com)**

**[www.adventurecorps.com](http://www.adventurecorps.com)**


**Runners on cover**

Jay Birmingham, 1981

Pam Reed, photo by Dave Nelson, 2002

# adventureCORPS™

## "We're Out There"



Dear Badwater friends:

Welcome to the Kiehl's Badwater Ultramarathon, the world's most prestigious and most difficult ultra running event. This legendary 135 mile running race from Badwater in Death Valley (elev. 280 feet below sea level) to Whitney Portals on Mt. Whitney (elev. 8360 feet) takes place July 22-24, 2003. Our 2003 edition celebrates the return of Jay Birmingham, the man who "made it a race" back in 1981 when he broke the original record set by Al Arnold in 1977. The 2003 Kiehl's Badwater will be dedicated to Jay and then, twenty-two years after he turned this event into a race, he will take his place on the starting line and contest the event with 80 other international runners.

AdventureCORPS is an athlete-run extreme event production company and we are very proud to carry on the legacy of Al Arnold, Jay Birmingham, and the other heroes of the desert who have gone before. Now in our fourth year producing this race, we are pleased to introduce our new title sponsor, Kiehl's, the hair and skin care company founded in New York City in 1851. We also extend special thanks to Badwater Mayor Ben Jones and First Lady Denise Jones for all their work as the Training Clinic hosts and so much more.

Further thanks go to all the people behind the scenes who help to make this race happen. An incomplete list of these generous folks must include Deborah Caplan, Leonard Bertain, Dan Dominy, Laurie Hennessy, Dave and Margaret Nelson, Dave, Steve, and Don Reese, Phil Marchant, John Wiley, Randy Klassen, Bruce Gungle, Dr. Lisa Stranc, Leon Draxler, Greg Minter, Anurang Revri, and many others. We also extend special thanks to Matt Frederick for the design and layout of this Race Magazine and his help with the webcast. Thanks, team!

We wish you the best of luck with your training and organization and we also encourage you to supplement your preparation by carefully studying both this Race Magazine and our race website, [www.badwaterultra.com](http://www.badwaterultra.com). We look forward to meeting you in Furnace Creek. Feel free to call, write, fax, or email at any time. We are here to help, motivate, and congratulate!

Sincerely,



Chris Kostman  
Race Director

11718 Barrington Ct. #342 Los Angeles, CA 90049-2930 USA  
Pho 310-472-1983 • Fax 419-818-5393

## General Information

**DATE:** July 22-24, 2003.

**DISTANCE:** 135 miles.

**WHO:** An international, invitational field of approximately eighty endurance athletes representing ten or more countries.

**OFFICIAL CHARITY:** The official charity of the 2003 Badwater Ultramarathon is the Challenged Athletes Foundation. One of the goals of the 2003 race is to raise awareness of, and funds for, this organization. The Challenged Athletes Foundation was created on the belief that people of all abilities should have the opportunity to pursue a life full of physical activity and of sports. Be they recreational or in pursuit of a gold medal at the Paralympic Games, people with a physical disability are limited only by their access to funding. Visit [www.challengedathletes.org](http://www.challengedathletes.org) or [www.badwaterultra.com/caf/](http://www.badwaterultra.com/caf/) for more info.

**MANDATORY RUNNER CHECK-IN:** 12:00-2:00PM, Monday, July 21, 2003, Visitors Center Auditorium, Furnace Creek, CA. Every runner must personally attend at some point during the two hour time-frame. Photo identification is required for all runners. Please bring the completed Runner Check-In Form and signed waivers for all crew members and the runner. All paperwork must be complete before walking in the door.

**PRE-RACE MEETING:** 3:00PM to 5:00PM, Monday, July 21, 2003, Visitor's Center Auditorium, Furnace Creek, CA. Runner and at least one crew must attend for the entire meeting. All crew members should attend.

**MEDIA MEETING:** There will be a brief meeting of all journalists after the Pre-Race Meeting in the auditorium.

**FOOT CARE CLINIC:** First Lady Denise Jones will host a foot care clinic, free of charge, immediately after the conclusion of the Pre-Race Meeting in the Auditorium.

**STARTING LOCATION:** Badwater, Death Valley, CA, 280 feet below sea level.

**STARTING TIME:** 6:00AM, 8:00AM, and 10:00AM, Tuesday, July 22, 2003. Up to 30 runners per group. Runners may attend only their assigned start time. Runners must check in at Badwater, ready to race, 30 minutes prior to their start.

**ENDING LOCATION:** The end of Whitney Portals Road, above Lone Pine, CA, on Mt. Whitney, elevation 8360 feet. The race does not continue up the Whitney Trail further onto the mountain.

**ENDING TIME:** The event is officially over 60 hours after each starting group, so either 6:00PM, 8:00PM, or 10:00PM, Thursday, July 24, 2003.

**COURSE RECORDS:** Men's: Anatoli Kruglikov, 2000, Russia, 25:09:05. Women's: Pam Reed, 2002, USA, 27:56:47.



Al Arnold at 2003 Badwater Ultramarathon start.

PHOTO: CHRIS KOSTMAN



**RACE IDENTIFICATION:** Each entrant is assigned a race number for identification purposes. The race number must be worn unmodified and visible at all times during the race. Racer numbers are listed on the race roster. The actual race number to be worn will be issued to the runner only during the Pre-Race Meeting. Photo identification is required for all runners.

**POST RACE GET-TOGETHER:** 6:00PM, Thursday, July 24, 2003, Lo-Inyo Elementary School, Multi-Purpose Room, Lone Pine, CA. All racers are encouraged to complete the race in time for this event! Pizza and drinks will be served at this informal get-together. There will be an open microphone for runners to thank their crews and tell stories.

**POST RACE BREAKFAST:** 8:00AM to 10:00AM, Friday, July 25, 2003, Seasons Restaurant, 206 South Main Street, Lone Pine, CA. This will be an informal get-together, planned to provide one last opportunity for Badwater runners and crew to get together and share stories. Juice, coffee, muffins, yogurt, and the like will be provided. Room for 75 people total! First come, first served. No charge.

**AWARDS:** All racers who begin the event will receive a Badwater Ultramarathon race t-shirt, hat, and Race Magazine. All racers who officially complete the event within 60 hours will receive a commemorative certificate, a finisher's medal, and a finisher's t-shirt. All racers who officially complete the course within 48 hours will also receive a commemorative Badwater Ultramarathon buckle (Buckles, t-shirts, and certificates are sent in the mail after the race).

**RACE HEADQUARTERS:** This will be set up in a hotel room in Furnace Creek, then in Lone Pine. Time Station splits will be collated here and updates posted to the race website on a continual basis.



PHOTO: CHRIS KOSTMAN

The 2002 Webcast Crew: Matt Frederick, Anurang Revri, and Scott McQueeney

**WEBCAST:** Spread the word that we will post time splits, commentary, and images on a continual basis for the duration of the 60 hour race at [www.badwaterultra.com](http://www.badwaterultra.com). We will be "live" throughout July 22-24, plus will keep the entire webcast indexed there forever! We will post time splits, images, and much more, beginning a few hours after the start of the race. As for time splits, keep in mind that the first time station is 17 miles into the race and it will take people several hours to get there. And remember, this is a webcast, not television. You have to be patient and keep in mind that you are not "viewing" the race in "real time." That said, it's going to be great!

**DONATE YOUR LEFT-OVER GEAR:** After the race, when you're staring at coolers, folding chairs, umbrellas, and things you can't get on the plane with you, please donate them to a good cause, such as the Lone Pine Chamber of Commerce, Good Will of Santa Monica, and the Las Vegas Rescue Mission. Thanks to Elizabeth Mullen of [www.litterproject.com](http://www.litterproject.com) for her help with this.

**RENTAL CAR SPECIAL RATES:** Participants in AdventureCORPS events can receive special discount rates on cars and vans from Enterprise Rent-a-Car. Call 800-325-8007, 800-593-0505, or any local branch and mention account # 32C1631.

**DIRECTIONS TO FURNACE CREEK:** Here is the most direct route from Los Angeles (or anywhere that passes through Mojave on the way to Death Valley): Reset odometer to zero in Mojave and take Hwy 14 north. At mile 20, veer right onto Randsburg Road. At mile 32.2, stay straight (not right). Go left at the t-intersection junction with Hwy 395 at mile 40.5. At mile 43.6, turn right on Searles Station towards Trona (easy to miss). At mile 50, a t-intersection, turn left to Trona. At mile 58.4, another t-intersection, turn right on Hwy 178 towards Trona. Pass through Trona, including its Texaco gas and mini mart, at mile 71.0.

At mile 104, you have two options. If it's nighttime or you don't like a little adventure, turn left towards Death Valley via Hwy 190. At mile 117.5, turn right at the t-intersection on Hwy 190 towards Death Valley. You will go over Townes Pass (elev. 4965'), pass through Stove Pipe Wells (gas, mini mart, hotel, and restaurant), then arrive at Furnace Creek at mile 170.

Your second option back at mile 104 is infinitely more fun and interesting, as well as even quieter. It's truly epic and feels like going back in time a few zillion years. So, at mile 104, if it's daylight and you have a working spare tire in your car, stay straight towards "Death Valley via Wildrose" instead of veering left as in option one. You will ascend over Emigrant Pass (elev 5318'). But first you'll go over three very short gravel stretches. They are only a few tenths of mile each and are easily passable in a normal car, unless there's a storm dumping on you. Be sure to check out the neat little oasis-like canyon you'll

pass through. At mile 113.5, go left at the t-intersection towards Stove Pipe Wells and Furnace Creek. At mile 121 you'll summit Emigrant Pass. At mile 134.3, turn right at the t-intersection with Hwy 190 towards Furnace Creek. You'll pass through Stove Pipe Wells at mile 143.5 on your way to Furnace Creek, which you'll reach at mile 168. Voila!



Badwater in the morning

PHOTO: TONY DIZINNO

**RACE HOTELS:** We have reserved blocks of rooms in Furnace Creek, Stovepipe Wells, and Lone Pine during our event. Use the information provided here to make your reservations and to secure the special rates that we have obtained for Badwater Ultramarathon racers, crew, and staff. Do not delay in making your reservations; the Death Valley area is a very popular place during the summer.

### **Furnace Creek Inn and Ranch Resort (mile 17)**

Phone 760-786-2345, Fax 760-786-2307

Booking Number: 5446

Password: Badwater Ultra

Rates: \$105/night for one or two occupants; \$20 per room extra for each additional occupant; \$20 for a rollaway bed.; plus 9% tax and a \$2.50 energy surcharge. Reservations must be made by phone or fax. Do not use their website if you want to use these special rates or use rooms that we have blocked for our group. Be sure to use the booking number and password and be clear on exactly what type of

accommodations you require. We have a block of 30 rooms reserved on 7/20 and 70 rooms reserved on 7/21.

### **Stovepipe Wells Village**

*(mile 42 on race route)*

Phone 760-786-2387, Fax 760-786-2389

Password: Badwater Ultra

Rates: \$70/Standard: two beds; \$92/Deluxe - larger room with TV and fridge - with one or two beds; plus 9% tax. Reservations must be made by phone or fax. Be sure to use the password and be clear on exactly what type of accommodations you require. We have a block of 40 rooms reserved.



Jason Hodde and Chris Kostman

### **Panamint Springs Resort**

*(mile 72 on race route)*

Jerry Graham, owner

775-482-7680

775-482-7682 (fax)

website: <http://www.deathvalley.com>

(Many entrants like to reserve a room here for use during the race.)

### **Lone Pine**

*(mile 122 on race route)*

### **Dow Villa**

Yolanda Chavez, Manager

310 South Main Street

Lone Pine, California, 93545

800-824-9317, 760-876-5521.

760-876-5643 (fax)

email: [dowvilla@qnet.com](mailto:dowvilla@qnet.com)

They have 40 rooms set aside under "Badwater Ultra."

### **Best Western Frontier Motel, Inc.**

Jerre Noland, Guest Services Supervisor

1008 South Main Street

Lone Pine, California, 93545

800-231-4071 (in California), 760-876-5571

(fax)

They have 45 rooms set aside under "Badwater Ultra."

### **Alabama Hills Inn**

1920 South Main Street

Lone Pine, California, 93545

800-800-6468 (toll free), 760-876-8700, 760-

876-8704 (fax)

### **Mt. Whitney Motel**

305 North Main Street

Lone Pine, California, 93545

800-845-2362

### **Lone Pine Budget Motel**

138 West Willow

Lone Pine, California, 93545

760-876-5655, 760-876-5738 (fax)

### **Trails Motel**

633 South Main Street, PO Box 65

Lone Pine, California, 93545

800-862-7020

### **Portal Motel**

425 South Main Street

Lone Pine, California, 93545

800-531-7054, 760-876-5930, 760-876-5517

(fax)





## From Lowest to Highest: Birmingham Claims Another Record

*Combined reprint from the Starting Line Newsletter and the Florida Times-Union, 1981*

Jay Birmingham, Jacksonville's running guru, co-founder of the Jacksonville Track Club, and distance runner extraordinaire, spent his summer, like most of us, running in the heat. But it wasn't enough that he put in his miles in the sticky humidity and upper-nineties heat of Florida. No; Birmingham decided to put his 100+ miles per week of training to the test in California's Death Valley.



On his first attempt, Jay succeeded in his quest to improve on the record for running from the lowest point in the country (Badwater, in Death Valley) to the highest mountain peak in the 48 United States

(Mount Whitney), both in California, and "only" 146 miles apart. With his family serving as support crews and running companions, the 36-year-old Episcopal High School biology teacher covered the distance in 75 hours and 34 minutes.

His time eclipsed the record set in 1977 by Al Arnold, a native Californian who failed at least two other times to complete the route. Arnold's solo record time was 84 hours.

Last summer, Birmingham captured the imagination and support of much of the Jacksonville community with his solo run from Los Angeles to New York City, a distance of almost 3000 miles in just under 73 days. On the eve of his departure from L.A., he met an experienced desert runner named Gary Morris who provided Jay with a desert shirt to help with his trans-America run. Morris was hoping to break Arnold's record last year but managed only 60 miles before extreme heat and nausea halted his quest.

"The Death Valley run was tough," Birmingham reported from a Las Vegas hotel where he and his family were recovering last night. "The highest temperature was over 120. But it was snowing on the summit of Whitney. This was, without doubt, the toughest 146 miles I've ever run."

The 145-pound veteran of over 60 marathons prepared all summer for his confrontation with historic Death Valley, putting in more than 100 miles a week, most of it in Jacksonville's sultry summer heat. The final three weeks of preparation were in the mountains of North Carolina and Colorado to get, "some climbing legs and altitude acclimation," Birmingham said.

Unlike his solo trans-continental run of 1980, Birmingham had his family along on this quest. Wife Anita, a teacher at Arlington Elementary, and their three children, Bob, Scott, and Tammy Reardean—all standout runners at Episcopal High School—served as support crew and running companions. All five climbed the final steep eleven miles of the trail to Mt. Whitney's summit. The peak, at 14,496 feet, is the highest mountain in the lower 48 states.



Climbing the Portals Road.

Birmingham started at Badwater, the lowest point in the western hemisphere. Located at 282 feet below sea level in the southern part of Death Valley National Monument, a two-lane road took him and his family north, then west over two small mountain ranges. After three days of running in century heat, about 45 miles a day, Birmingham confronted Mt. Whitney in the Sequoia National Park, part of the Sierra Nevada range.

"Training in the heat and humidity of Jacksonville was great preparation," Birmingham said. "There's almost no humidity out here. I was very conservative because of my apprehension about the extreme heat."

Birmingham has always competed strongly under hot conditions so the idea to pursue the Death Valley mark was a natural. With the encouragement and financial backing of Baptist Medical Center, Jay bumped his mileage over the 100 miles per week level as soon as his teaching duties at Episcopal H.S. were done in May.



Jay victorious at the Whitney summit.

Many hard-core Jacksonville locals have competed in the Sand Dunes Challenge, a five-mile ordeal through the soft sand near Regency Square in the Arlington area. But Jay ran that course every other day at noon in the month of June. He alternated the sand runs with multiple loops over the Main Street and Acosta Bridges. To prepare for the mountains, Birmingham ran the Gulf Life Tower's 26 floors, five times, once a week. His long run was typically the 21-mile, 21-hill Lydiard Course near his home in east Jacksonville.



Wife Anita, sons Bobby and Scott, and daughter Tammy, all prepared well themselves. The whole family raced in the Pikes Peak Marathon or Ascent just a few days before heading to Death Valley. From August 15 through the final miles on the 18th, Bob ran many miles of the DV route with Jay. The entire family hiked and jogged the final 11 miles up Mount Whitney's 14,496-foot summit. After three days of heat ranging from 95 to 120 degrees, they finished in a snowstorm!

Jay said the run in Death Valley was the best-planned run he has ever done. His preparations went smoothly, no injuries interrupted his training, and his fitness was high, even by his standards. Nevertheless, Birmingham said that he was conservative because of the failures of others. He believes many Jacksonville Track Club runners could accomplish the run and do it much faster.



## Badwater Ultramarathon

### Crewing Tips

By First Lady Denise Jones

Due to the unique nature of the Badwater Ultramarathon, we thought it might be helpful to make some suggestions with the hopes that they might insure a successful experience for both the competitors and their crewmembers. As most of you know, the crew is essential to the competitor completing this event and is, in fact, required by the race rules. Crewing for this race can be as taxing as competing (we've done both). Thus, we share some ideas that have helped us during the event.

#### You can expect:

EXTREME HEAT

EXTREME EXHAUSTION

EXTREME FRUSTRATION at times

EXTREME CONFUSION

EXTREME JOY....when it's over!!!!

1. The crew needs to familiarize themselves with the crew vehicle and it's organization. It would be advantageous for the athlete to be involved in setting the crew vehicle up so it can be arranged in a manner that makes logical sense to everyone that will be working out of it. Keeping the crew vehicle clean and organized helps everyone, too. Putting things back where you found them makes it easier for the next person on shift.

2. Crew members should decide in advance when rest breaks will take place, so that at least one crew member is always well rested. If there are more than two crew, it's a bit easier to take rest breaks. During the rest, try to rest or sleep. A tired crew is no help to the athlete. We get motel rooms for our crew, but I know it's not always possible due to some budgets. If at least one crew member is mentally sharp and

fairly well rested, it makes the entire experience run more smoothly. By the time the competitor is tired, decisions are harder. If everyone is tired, it's much harder to keep the competitor moving.

3. Hopefully the crew will be familiar with blister treatment. If not, please try to get some help before the race starts with someone that has treated blisters. Often, it seems, even when most athletes don't usually have blister problems, they tend to blister in this race due to the excessive heat of the pavement. Try to have a blister kit organized specifically for this issue. It's been a lifesaver for most competitors.

4. It has been our experience that if a water sprayer is used for cooling down the athlete, avoiding the legs is helpful. It seems that when the water runs down the legs, feet blister more, and can cause chafing of the thighs. One competitor had to drop



PHOTO: CHRIS KOSTMAN

Curt Maples and Crewmember - 2000

out a couple of years ago due to the crew not knowing this. Sometimes athletes like their legs cooled, but be sure to check first before letting loose with the sprayer. Don't be surprised if your athlete gets heat rash on legs. I've had it twice in this event. It goes away and Desetin ointment helps!

5. Crews need to be aware that they MUST drink fluids to prevent dehydration...not just the athlete. We've seen a lot of sick crew from not watching out for their own welfare while in the throws of crewing.





It's easy to get distracted and forget to drink...! Iced fluids seem to keep the body temperature down better. We ice everything.

6. Sunscreen and sun protective clothing are necessary for crewing, as well as running. Sunburned crew aren't happy crew. Hats are essential. The hazards of sunburn, dehydration, and sunstroke are very real for the crew as well as the athlete. Beware of how quickly this can happen. It can happen in as little as 15 minutes.

7. Hopefully, crewmembers will cooperate with each other to make the whole experience a memorable one. Communicate with the athlete, and with each other as crewmembers. Watch your athlete's moods and behavior. Low moods are expected at times, but sometimes can indicate low blood sugar. It's as simple as giving something with sugar in it to help.

8. If you encounter problems with your vehicle or your athlete, take care of them immediately. The sooner a problem is addressed, the soon it can be resolved. We've even encountered flat tires out there. The U-Haul company sent mechanics out on the course (from Ridgecrest) to fix our tire while we continued in the race (thankfully we had dual rear wheels).

9. Watch out for the traffic. Be careful crossing the road on foot. Make sure your crew vehicle is parked completely off the pavement so you won't get a ticket or cause an accident.

10. Please don't litter!

The Badwater Ultramarathon is a unique event. It is.... EXTREME! Please understand that by your crewing you are helping your athlete complete a very important goal. Good crew attitudes along with

good manners and organization can make this an amazing and thrilling experience for everyone. You will enjoy a great sense of achievement to have joined your athlete in this event. We truly believe that no one who participates in this event leaves it the same. It will be a very memorable life experience, and we know your athlete will be grateful to you for your help forever! And, last but not least, we are hoping that everyone has a memorable, enjoyable and successful race in 2003!



Dan Jensen - 1999

PHOTO: CHRIS KOSTMAN





## Suggested Badwater Ultramarathon Checklist

By Badwater Mayor Ben and First Lady  
Denise Jones

### GEAR:

- ☐ Flashlight(s): regular and mini-mag light.
- ☐ Ice chests and large fluid container.
- ☐ Folding chair(s) with cot.
- ☐ Umbrella (for sun).
- ☐ Trash bags and/or trash barrel, broom.
- ☐ Zip-lock bags.
- ☐ Cutting board and utensils, plates, cups, etc.
- ☐ Bucket or basin (for feet, etc.).
- ☐ Scale for weighing runner during race; don't use digital read-out.
- ☐ Matches.
- ☐ Burner (camp stove).
- ☐ Electric coffee pot or hot plate or toaster/oven for heating water, cooking, etc.
- ☐ Extension cord and a variety of electrical adapters (two-to-three-way, socket type, etc.)
- ☐ Small microwave oven. (Optional but can be helpful at Stovepipe and Panamint.)
- ☐ Water sprayer
- ☐ Clipboard, pens, pencils, note paper, etc.
- ☐ Duct tape. (Not for feet.)
- ☐ Rope, cord, string, etc.
- ☐ Towels (including beach towel) and rags.
- ☐ Paper towels and napkins.
- ☐ Soap (dish soap), sponges and scouring pads.
- ☐ Bug spray.
- ☐ Step for getting in and out of vehicle. (Or use as a chair.)
- ☐ Porta Potti and toilet paper.
- ☐ Camera(s) and film.
- ☐ Cellular phone. (Optional but very popular and unreliable.)
- ☐ GPS (global position system)(For techo-nerds only.)
- ☐ Crisp \$1.00 bills for vending and ice machines.
- ☐ Coins for vending machines.
- ☐ Maps: Inyo County, Death Valley, Owens Valley, Whitney (topo).



Badwater Mayor Ben Jones M.D. and First Lady Denise Jones

PHOTO: CHRIS KOSTMAN



Debbie "Dolphin" Caplan and Mary "MC Hammer" Campilongo

PHOTO: CHRIS KOSTMAN

**FOOD AND DRINKS:**

- ☐ Water: bottled; lots.
- ☐ Electrolyte/fluid: E-CAPS, Gatorade, Cytomax, Exceed, Club Soda, etc. plus pretzels, peanuts, corn-nuts, salt, etc.
- ☐ Carbohydrate: Sustained Energy, Hammer Gel, Carboplex, Gum drops, jelly beans, fig newtons, pop tarts, plus watermelon, cantaloupe, oranges, and other fruit.
- ☐ Caffeine helps at night: Soda, coffee, tea, cocoa, etc.
- ☐ Other food: Dark bread, sliced turkey, jack cheese, peanut butter, jelly, etc., for sandwiches.
- ☐ Chicken noodle soup, Cup-of-Soup, etc. Oatmeal packets, jerky.

**MEDICINES:**

- ☐ Sun block, chap stick, zinc oxide, etc.
- ☐ First aid kit (basic).
- ☐ Thermometer for body and outside air temperatures.
- ☐ Diamox 250 mg tablets for high altitude sickness prevention. (Suggested-see your medical doctor).
- ☐ Water purification tablets or water filter for Giardia on Whitney trail (if you are hiking after the race is over).

**FOOT BOX:**

- ☐ Micropore tape (3M), Band-Aids, dressings, etc.
- ☐ Compeed, Elastogel, Duoderm, etc., for pressure areas and blisters.
- ☐ Swabs, needles, razor blades, tweezers, scissors, etc.
- ☐ Nylon stockings, ankle length, to go over skin before socks to help prevent chaffing and blistering

**RUNNING GEAR:**

- ☐ Full coverage solar-protective clothing.
- ☐ Race number must be worn unmodified at all times.
- ☐ Running shoes (several pairs) and maybe one size larger than ordinary. (Use white or light-colored pair, not dark!)
- ☐ Inner soles and/or orthotics, Sof Soles work well for us for cushioning and insulation.
- ☐ Socks, double thickness work well. (Consider Supphose for swelling.)
- ☐ Hat with long-bill or wide brim plus shroud.
- ☐ Dark glasses (Two layers, one which flips up or down).
- ☐ Summit goggles and or shields for side-stems (for side-glare).
- ☐ Consider nose shield which fits on glasses.
- ☐ Goggles (swimming type) for sand storms
- ☐ Scarf or handkerchief.
- ☐ Reflective gear (mandatory), strobe light, flashers, etc., for dusk till dawn.



## Badwater Blister Buster

*By First Lady Denise Jones*

Running Badwater is the true test of an athlete's endurance, training, tactics and proper body maintenance. One of the obstacles that seems to prevent many from finishing is problems with blistering. Before competing in my first Hi-Tec Badwater race in 1994, I had the privilege of Rhonda Provost teaching me foot-care techniques. (In 1995 she became the first woman to do the double-crossing from Badwater to Whitney and back.) Since that time, I've taken advice from other runners as well, with the hopes that we could devise some way to prevent the inevitable blistering problems that develop during this event. When I competed the second time in 1996, I was able to finish the race with NO blisters at all by using the following techniques. My hope is that these tips will help you, the competitor, successfully travel this course in more comfort, due to sharing the techniques I have learned over the years.

I have seen and worked on feet so unbelievably blistered from this event it would make you think they have been boiled in oil. Often it has been a complete surprise to the athlete, as more often it seems many have taken it for granted that they won't blister in Badwater because they don't blister in other 100 milers. Please take the precautions, and maybe you can get through this event without them! Even with these measures I suggest, it's not always the cure. In 1998 I spent significant time with Robert Thurber from Texas. By Panamint (72 miles) even with prior taping, his feet were so bad he had to be carried off the course. I tried everything to prevent this from happening to him, but his calluses were very thick, and he had blistered massively on his heels under them.

I also highly recommend the book advertised in UltraRunning Magazine, "*Fixing Your Feet*", by John Vonhof. It is a very complete practical synthesis on proper foot care. He goes into a lot of specifics on every detail of foot care, and where things can be purchased. It's just great and I believe every competitor would benefit from using it.

My booklet is specific to Badwater, therefore it might differ somewhat from the techniques that Vonhof recommends in his book.

### Items for foot care box:

- Swabs (for applying benzoin.)
- Toe nail clippers, fingernail file, pedicure file.
- Alcohol swipes.
- Tincture of Benzoin (it also comes in spray.)
- Sharp scissors (very pointed.)
- Tweezers to pull blister out to cut a hole in it.
- Tapes (Micropore and Elastikon.)
- Foot powder
- Betadine (for cleansing.)
- Extra Socks
- Second Skin (A gel for burns and blisters.)

### Preparation of Feet Before Race:

File down any calluses with a pedicure file so that if a blister develops you can get to it so it can be treated. If thick calluses are allowed to remain, they are next to impossible to get underneath to fix the blister during this event. Many times it has caused an athlete to drop out. Trim toenails (square) and file them so no rough edges remain.

### Pre-Race Taping:

I recommend pre-taping the night before the race so the tape has time to conform to your feet. By taping the night before, it's one less thing to get together on race

day, and if anything comes unstuck it will take less time to fix. Micropore (by 3M) seems to work well (it is like paper) and conforms to the shape of the foot. Another tape that has been helpful is Elastikon (by Johnson&Johnson). It is slightly thicker and stretchy for the heels and balls of the foot and it is breathable. **I DO NOT** recommend duct tape. We have found that duct tape doesn't breathe and causes the area that has been taped to become edematous, sometimes causing worse blisters underneath the tape. It also tears the skin that has been taped when it's removed, causing a great deal of pain. Pre-tape any areas that have blistered before, or might be a friction point. Spread Tincture of Benzoin (from a pharmacy) over the area to be taped. Allow the Tincture to become tacky, then tape as flatly and neatly as possible. Cut off any wrinkles or corners of the tape.

#### **Socks:**

Make sure you've tried your socks prior to the event. Everyone seems to have their own favorite. Ultrathins, double layer, Ultimex, and Thorlos are all good. Seams are sometimes a problem. It can help to turn the seam-side out. Any sock needs to fit well, with no wrinkling. Cotton socks provide no wicking and tend to make balls (pills). Any amount of sand in a sock seems to cause blistering.

#### **Shoes:**

Make sure shoes aren't black as they absorb too much heat. Make sure insoles are insulating. I wear very padded orthotics that also provide insulation against the heat. Consider extra cushioning but don't try something you haven't trained with. Ankle nylons have been used to provide the innermost layer, then ultrathin socks. Personally, I found them too slippery. They caused my feet to move around too much in the shoe, which can also cause blisters. Have an extra pair of shoes available in case your feet swell. It also helps to keep them in a zip-lock bag in the ice

chest, if you have room, to keep them cool. I've been able to complete the race in the same pair of shoes, however.

#### **Treating Blisters After They Develop:**

Clean the area with alcohol. Drain blister by cutting a hole in it, (a small hole not a pin prick.) This prevents the blister from refilling. Place Second Skin over the blister. Try to leave skin intact over the blister. Treat the area with Tincture of Benzoin, once again, so that the tape will stick. Tape over Second Skin. Once the skin is moist from sweat, it's harder to get the tape to stick. I use foot powder (Zsorb) to dry the feet after the benzoin and before the taping.

#### **Lanolin or Vaseline:**

Some runners like to use these preparations to prevent blistering. I have found that they don't work for me. The drier I can keep my feet, the better. However, if using such a preparation has worked for you and you've trained in the desert with it, then by all means use it!

#### **Compeed:**

I have had no success using Compeed for Badwater. Others have used it to alleviate the pain of a blister quickly. The problem seems to be that it might help at the immediate time, but trying to get it off is a nightmare. It sticks to the skin and shifts. I treated three athletes one year that were in terrible pain from Duct Tape and Compeed. They wanted to climb Whitney after the race and their feet were in such bad shape they could hardly walk. In trying to remove it, the skin over the blister and the tissue underneath often comes off. The raw flesh is very tender and susceptible to infection. You might try it as a last ditch resort, but I've treated some very painful feet due to it's use.



## Medical Risks in the Badwater Ultramarathon

This 135 mile race is probably the most physically taxing competitive event in the world. It also has considerable medical risks. All runners and crews must appreciate these two facts both before and during the race.

Heat illness and heat stroke are serious risks. These can cause death, renal shut-down, and brain damage. It is important that runners and crews be aware of the symptoms of impending heat illness. These include: nausea, vomiting, headache, dizziness, faintness, irritability, lassitude, weakness, and rapid heart rate. Impending heat stroke may be signaled by a decrease in sweating and goose bumps, especially over the chest. Heat stroke may progress from minimal symptoms to complete collapse in a very short period of time. Deaths and renal shutdown (kidney failure) have been reported in other ultra-marathons. Adequate conditioning is mandatory.

Adequate fluid and electrolyte intake is the most important preventative for heat illness. Runners may well require dozens of gallons of fluid during this race. Proper pace is crucial.

The high altitude plus exertion can also produce various degrees of altitude sickness. This can lead to severe lung and brain swelling, and even death. The main treatment is rest, and especially to get to a lower altitude.

Blisters are also a problem on this course, with pavement temperatures perhaps reaching 200 degrees. Proper foot care & preparation are essential for having a successful race.

Remember, you are responsible for your well-being while participating in this race. **There are no aid stations.** Know where your limits are and know your body. Your acceptance of invitation to this race declares that you are aware of the risks & potential health problems.



PHOTO: CHRIS KOSTMAN

Eric Clifton - 1999



## Heat Training & Conditioning

By Badwater Mayor Ben Jones, M.D.

I am a long-time physician in the high desert area, living and practicing in Lone Pine, California. It is at the foot of Mt. Whitney and at the threshold of Death Valley. I have treated cases of every imaginable medical circumstance including heat exhaustion and heat stroke (including disseminated intravascular coagulation). Since 1990 I have been involved in the annual Badwater Ultramarathon (formerly the Hi-Tec Badwater 146).



PHOTO: TONY DIZINNO

In 1991 my claim to fame happened during the race. About a week before 14 of us started at Badwater, Death Valley, there was known to be a trekker missing who had attempted to traverse Death Valley east to west 10 miles and then return. During the race, I was approaching Lone Pine some 122 miles later and saw the coroner traveling in the direction of Death Valley. By the time I had made it to Whitney Portals at 135 miles, I got word that he wanted me to do an autopsy. I obliged and then re-entered the course to complete the event to the top of Whitney at 146 miles. I am the only one of which I am aware who has ever performed an autopsy during a race. Besides that, I used a water-filled casket (body removal tank) for immersing myself in to cool down during the race. I am also the only one I have heard of to successfully get in and out of a casket before successfully finishing a race.

In terms of heat training and experience, I began to increase my exposure to the heat in 1990 when I went out on the Badwater course to see and help several friends who were in the race. While training to participate in 1991, I became acquainted with Richard Benyo and Tom Crawford of "Death Valley 300" fame; they had done the round trip from "Fire to Ice to Fire." As a result of this association and having done the autopsy, there was a touching ceremony at Badwater on 07-04-1992 where I was dubbed the "Mayor of Badwater" and my wife, Denise, the "First Lady of Badwater."

I completed the Race in 1991, 1992 and 1993 and did not finish on the next two attempts in 1994 and 1996. My failure in 1994, after 40 miles, was because I did not start the race hydrated well enough and that I stopped manufacturing urine. I gave myself four liters of IV's as I laid on my casket in the U-Haul before I started putting out urine. I felt that, if I were to continue, I would wind up on the renal dialysis ward. Because of the extra heat in 1996 and the resulting fatigue that existed, I pulled myself at 50 miles. I could have continued but I went ahead to support my wife and free up my crew for her as I would have finished beyond the 60-hour time limit. My wife finished successfully in 1994, 1996, and 1999.



PHOTO: LEN BERTAIN

Rick Nawrocki and Race Director Chris Kostman at finish line - 2001

One advantage I have in regard to heat training and adaptation is that I live in the high desert in the Eastern Sierra. In Lone Pine, it gets to above 100 degrees F in the summer and it is very dry with less than 10% humidity. It is usually 20 degrees hotter in Death Valley no matter what time of day or what day of the year it is. All I have to do is go eastward and hang around in the heat (in dark clothes) and do some light exercise.



PHOTO: CHRIS KOSTMAN

2002 Winner Pam Reed and crew crossing the finish line.

There is some very good scientific information about heat acclimatization that is very informative and can be found in "Marathon and Beyond" in the July/August 1997 issue: "Into the Valley of Death" by Richard Benyo and "Beating the Heat" by David E. Martin, PhD. Another valuable piece is in the "Encyclopedia of Sports Medicine and Science" on "Heat Acclimatization" by Lawrence E. Armstrong, PhD. My information below is more of a "by the seat of the pants" approach.

**"How long do you need to train in hot conditions to acclimate?"**

My answer is as long as possible, but, practically, about three weeks. Try to spend as much time above 100 degrees F as possible and that means traveling to

the low deserts of Southern California or the eastern desert areas such as Panamint Valley and Death Valley. It is necessary to spend time outdoors in these areas and just trying to relax while getting used to the heat. The training can be eased into. Of great importance is to have the potential crew members along also. The event being trained for can almost be more difficult and hazardous for them than for the performer. Most athletes cannot afford the time and cost of doing all of this, unfortunately.

**"When acclimating, how long and how hard should you exercise each day?"**

Long is more important than hard. Start easy and then work up. I like Walt Stack's creed of "start slowly and then taper off!" Calculate the distance being covered and the time limit imposed, then go from there according to your capabilities. For the Badwater Ultramarathon, 20-minute miles will cover the 135-mile course from Badwater to Whitney Portals in 45 hours. One can buckle in 48 hours. For this 135-mile Race, most of it is flat and I tried to do 15-minute miles for these 70 miles. I treated the 19 downhill-miles as flat miles at the same pace to save the legs. The uphill 18 miles from Stovepipe Wells Village to the top of Townes Pass and the 15 miles from Panamint Valley to the Darwin Flats I tried to do at a 20-minute-per-mile pace. For the steeper 13 miles from Lone Pine to the Portals, I tried to do at a 30-minute per-mile pace. The 11 miles up the Whitney trail I allowed a 1-mile-per-hour pace. So, setting a pace for the terrain of the anticipated race is necessary. This is not possible for a continuous race lasting more than 48 hours. The intensity and duration of training can be adjusted upwards for each additional day of training, but allow a few rest-days or, at least, a few rest-hours for you compulsive people. I would say try to do a mild

level of exercise for about 8 to 10 hours each day. The intensity can be adjusted upwards to a moderate level later. It is virtually impossible and essentially inadvisable to train at an intense level in these conditions. Try to gauge how many hours or days it will take to get through the anticipated event and heat and practice accordingly.

### **“Is passive acclimatization possible?”**

It certainly is and this is mostly what I do. Wear dark clothes while in the heat. Don't use air-conditioning. You can even roll up the windows of the vehicle and turn on the heater. My exercise base has usually been 1-2 hours of exercise a day every day in my calculated fitness range. [This is three to six times what is needed for general and basic health]. I have always been at the back-of-the pack, or, as I often announce, in the top 98%. In getting ready



Lisa Smith climbing Townes Pass - 2000

for this race, I like to go out to the desert and just kick back and do some hiking as well as strolling on the dry lake beds and over the sand dunes. I take a camera and a micro cassette recorder as well as some techno-nerd items. Try to have fun and visit with other desert rats. Be sure to write up your story even if you “fail.” Pass on what you learn. With progressive heat adaptation, I have found that I don't seem to sweat as much and my skin

doesn't seem to taste as salty, even if I am not exercising at the time. Fluid and electrolyte and calorie replacement are extremely important in these conditions for you and your crew. These are separate issues that could be covered later. Passive conditioning can get you by better than vigorous exercise. Decide what it is that you are trying to accomplish and set some goals.

### **“Can one simulate hot conditions at home?”**

Yes, and this has been done using a sauna and with maybe adding some minimal exercise. Get a medical checkup before starting all of the above activities. Another way to do it is wear extra (dark) clothing as mentioned above while exercising in desert-like conditions. Wear something that traps the heat for a while. Again, don't use air conditioning and roll up the windows and, if this doesn't do it, turn on the heater. I have done these things and when it is 120 degrees I don't even notice the blast from the heater. It does help the vehicle to run cooler, too. All of these things are useful, but the most important is to get in the right frame of mind about what is going to be done. You do have to get your skin, stomach and bladder through all of this too. I have had the advantage of living where I do and traveling frequently to the desert. I have practiced as a physician here since 1963 and have observed what can happen out here. Be careful!



## Heat Training Analyzed

By Stephen Simmons,

1999 Hi-Tec Badwater Finisher

After over a month of heat training preparation, I was fortunate to have had a successful run from Badwater to the summit of Mt. Whitney in the July 99 Hi-Tec Badwater race. I had no real knowledge of heat training before I began heat training, but I posted questions about it to the ultra list and got responses from others who had experience with, or were at least knowledgeable about, heat training.

Many of the ideas expressed were scientific; I did my best to interpret them. Some were more simplified, and out of all of them, I tailored a regimen to suit me personally, as anyone should do. Regardless of the different approaches there are some ideas and beliefs about training for and performing in extreme heat that are common, and as a conclusion to my experience with heat, I will write some of the more basic and simple ideas that I think are sound advice and good knowledge for dealing with it. These are only my opinions, and this is what worked for me.

### 1. Your body is a machine.

Your body is a machine that cannot be thrown into a very foreign and hostile environment such as extreme heat and be expected to perform at its usual high caliber. No matter how tough you perceive yourself to be, simply dealing with heat and accepting it won't be enough; you must physically adapt to the rigors of heat beforehand.

### 2. Simplified, sources of heat are:

A. External, from the environment, real ( sun, humidity, air temps, ) or simulated ( heavy layers of clothes that trap heat, blankets, ect...).

B. Internal, generated from physical exertion and output.

C. Both

### 3. When enduring extreme heat it is most important to stay cool internally.

A. By adding coolant. Drinking lots and lots of cold water and ice, the colder the better.

B. By keeping physical effort to a minimum.



PHOTO: TONY DIZINNO

### 4. External cooling.

People naturally sweat to cool off. In extreme heat however, your body might not sweat enough to cool you off, or, the outside environment might be so hot and dry that any perspiration evaporates off your body before it can have any cooling effect on it. Either way, sweat can be simulated by wearing very lightweight or cotton material clothing, long sleeve and preferably covering the legs also, and "continuously" soaking, spraying or saturating the clothing with cold water. The wet clothes against the skin will have the same cooling effect as sweat

### 5. The combination of keeping cool internally by:

A. drinking lots of cold water,



B. generating as little internal heat as possible by keeping physical exertion to a minimum,

C. and cooling externally by producing outside coolant in the form of artificial sweat should keep most people cool in the hottest environments if a person has these resources available.

## 6. Humidity.

When considering the temperature performing in, take humidity into consideration. From experience I know humidity is a silent killer. It is rare in the West, common in the East. Humidity zaps strength, dehydrates a person very quickly, and does these things suddenly without warning. A warm humid day is probably more dangerous than a very hot dry day.

In my opinion, the best way to deal with humidity is respect it. Even if it doesn't feel that hot, prepare for it by taking it easy and drinking lots and lots. Basically the same as for dry heat; that's why I say, above all else, respect it.

## 7. Regardless

Regardless, to perform in a hot environment at a race like Badwater some heat must be generated internally, and heat must be endured. To do so you must teach your body to adapt to the heat by teaching your body to sweat more, and locate a tolerable medium between physically pushing yourself and yet not overheating internally.

## 8. Over-dressed heat training.

A. Can be dangerous. Use good judgment and train in a safe environment, particularly one that is safe from traffic.

B. In the heat of the day, either go the whole nine yards and train in many heavy layers right from the start and run very limited mileage to understand how you will personally react to it, or, start with more routine mileage with perhaps just a sweatshirt and cold weather cap and add more layers and increase mileage as you adapt.

C. Drink lots and lots of water. Drive to pre-determined spots along your route and put cold water and ice out, or always be close to a source of cold water.

D. Pace yourself. It's easy to feel just as strong at the start, aside from feeling heavy, than normal. It "won't" last. Remember to generate as little internal heat as possible and plan on lots of walking.

E. Be prepared for nausea. In my opinion this results from the large amount of water in your stomach. Consider salt, rock salt, and E-Caps supplements to assist with this.

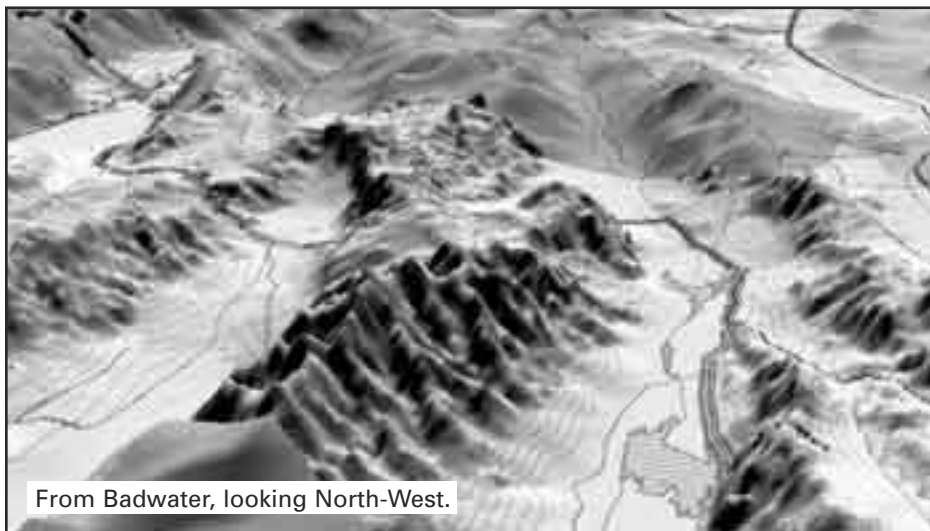
F. Keep up your energy. Just like in normal training, if you run for x amount of time, energy is needed, and even though you might not feel like eating, you must. You might require less energy intake than normal however. Liquid energy is one of the better or "easier" ways to supplement energy in the heat.

G. Keep your wits. The heat is something that can be very overwhelming mentally. If you start to panic or get the slightest bit confused or dizzy, slow down, sit in the shade, recover and cool down. You won't be able to escape the heat in the actual environment, however, so if at all possible, cool down by resting and minimizing your effort rather than by taking off any clothing. Tolerating the

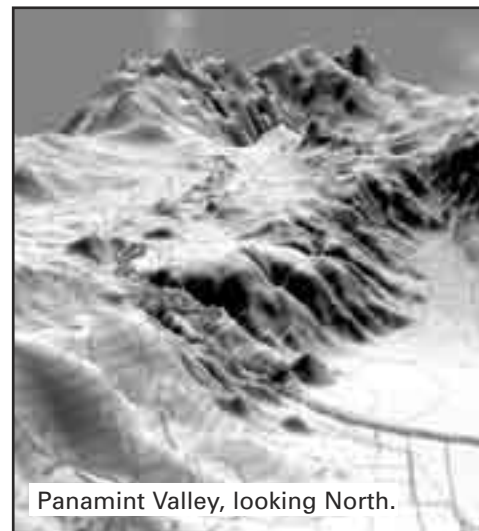




Overhead view of race course.



From Badwater, looking North-West.



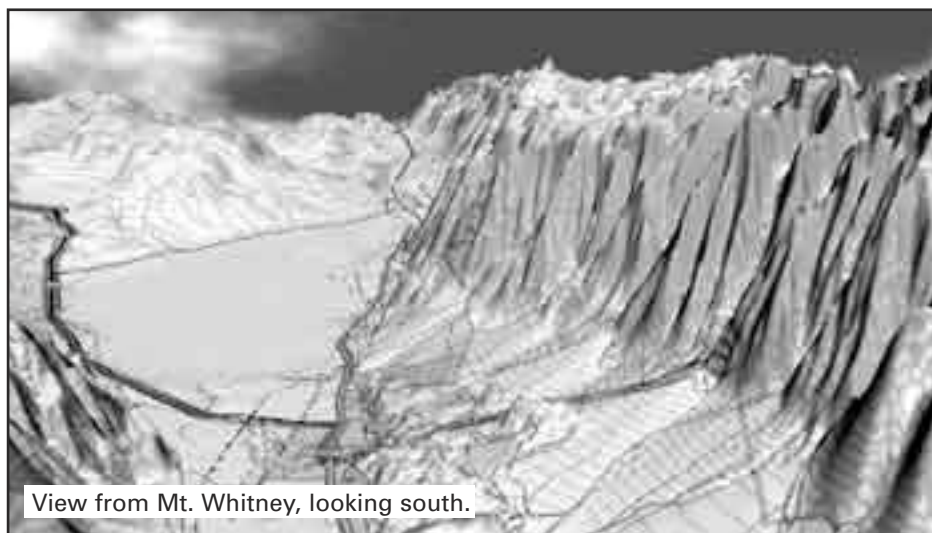
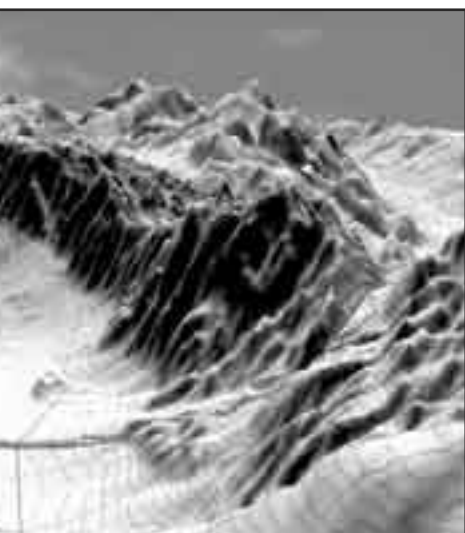
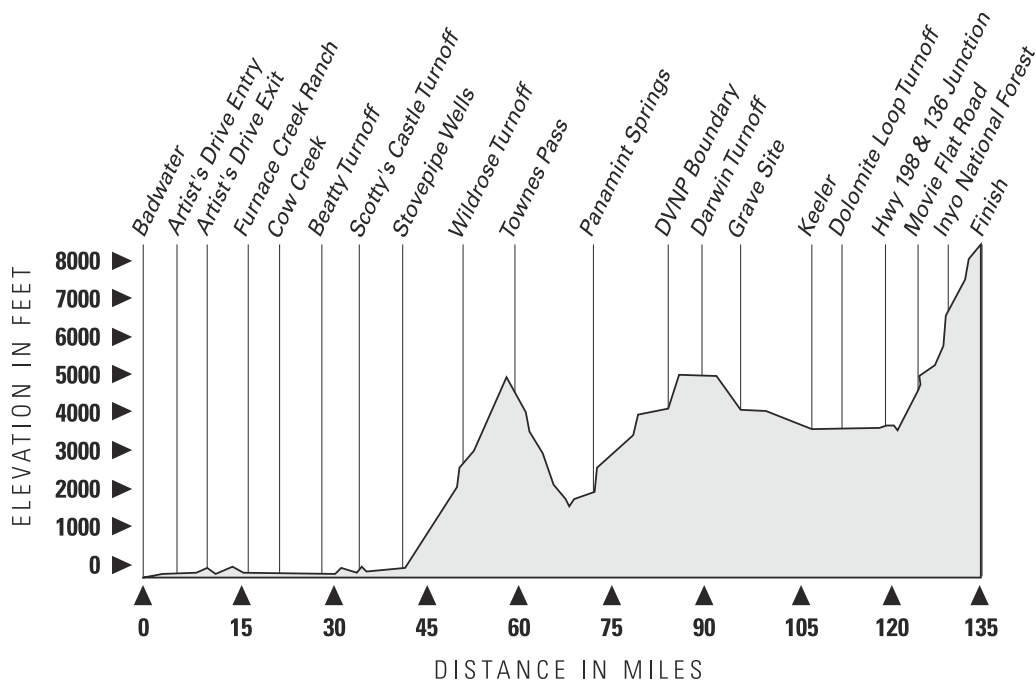
Panamint Valley, looking North.

3D Topographic maps by Doug "Dog" Sloan



# Badwater Ultramarathon

...a good comfortable road...



View from Mt. Whitney, looking south.

overwhelming heat can be a big moral victory, but when it comes down to it, safety is your main concern.

H. Make sure others know what your doing, where your training, when to expect you.

I. Know the symptoms of heat exhaustion and heat stroke. Prevention is easier than treatment.

J. The frequency of over-dressed training sessions is up to an individual. For me, I opted for about 2 extreme heat sessions a week, and then added one lesser element of heat to each regular training session, by running normally but in the heat of the day, or in the evening wearing a sweatshirt and hat, just always enduring a little more heat than I normally would in order to build an overall tolerance and acceptance for heat. My most extreme heat sessions consisted of wearing a Coolmax t shirt, a sweatshirt, a thick, insulated navy working jacket topped with a rubber, non-breathable, dark green raincoat and cold weather hat. Plus sweatpants off and on, and towards the end of my preparation gloves as well.

K. Run / Walks with climb from 1-2 hours average. Maximum heat endured dressed like so, 90 degrees + 100 % humidity for 4 hours, 9 miles with climb. Overall 10-11 "extreme overdressed sessions" over 5-6 week period before Badwater.

#### Important advice.

Have a good crew who has knowledge of what it takes to keep you going in the heat. My crew was very experienced and kept handing me another water bottle of ice water even before I could finish the one I already had. I probably

wouldn't have drunk quite as much had it not been handed to me so often. Have your crew think for you and keep you hydrated.

#### Personal Race Notes.

Temps at Badwater were lower than normal in 1999 but humidity was high. I stayed well hydrated throughout the race, wore Solar Eclipse sun hat, long sleeved Sun Precautions shirt, shorts. Wore cotton pajama pants some. Very dependable crew misted me down often and I stayed cool and never once suffered with the heat. Successful finish.

Heat-wise, I suffered much more enduring the heat during my over-dressed training than I did during the actual race. In my opinion I was able to perform well because I had physically adapted to heat and had mentally learned to accept heat, in addition to the cooling methods we used during the race.

GOD bless.



PHOTO: CHRIS KOSTMAN

Mike Trevino flying through Death Valley - 2001





## Heat Training in the Sauna

By Arthur Webb

*Five time finisher*

There are a number of ways to train for all the heat one will encounter in the Badwater Ultramarathon. Two effective methods are training in the desert, recommended by Dr. Ben Jones, and simulating the heat conditions by wearing layers of clothing while running, as suggested by Stephen Simmons. Definitive articles by these two gentlemen are posted on the badwaterultra.com website and elsewhere in this race magazine. Either method or a combination of both should help one adapt or acclimatize to the heat for a successful trek across Death Valley.

When desert heat is not available and one has problems running in lots of clothing, there is Tom Crawford/Richard Benyo's bake in the sauna option. I have used their method in a modified format and I firmly believe that it has been instrumental for my four successful journeys across Death Valley.

Most people don't have a sauna, so one has to make use of the local fitness center. If money is a problem, just let them know about Badwater and the charity you are running for and they will probably make you a deal.

Have no fear for there is still plenty of time to complete a training program. I won't begin mine until the last week in June.

### Nine Points

1. The sauna serves two extremely important functions. First, it prepares the body to deal with the blistering heat out in Death Valley. Secondly, but equally as important, it gets the body used to drinking and processing the tremendous amount of liquids you are going to need to survive and finish this incredible race.

2. Heat training in the sauna should take no more than four weeks; usually three weeks is enough. When you have to wear a sweater or light jacket at work or around

the house because you feel a little chilled, you are acclimated. It is best to stop sauna training at least three days before the race. You will need the time to super hydrate and the effects of heat adapting will not start wearing off for several weeks.

3. Train every day, although you may have to take a day off to completely hydrate yourself. If there is a steam sauna available, use it one day a week. Two years ago, at Badwater, tropical storms lashed the area for several days and it became extremely hot and humid. Fortunately, I had rotated between dry and steam saunas in my training and was ready for anything. It made a huge difference.

4. The goal is to stay in the heat of the sauna for as long as possible. If you attempt any kind of rigorous workout inside the sauna you will have to leave it too soon, which defeats the purpose. So, just be content with simply sitting on the planks or doing a light abdominal workout. Save your harder workout for your daily run. I find it easier to run my daily 10 to 20 miles first and then go lay down in the hot box. Running after a session is extremely difficult. Save this time for re-hydrating.

5. Be patient. Begin at low temperatures and gradually work towards hotter sessions. The first day I usually start at 110 degrees and stay as long as possible. Sometimes when it gets overbearing I leave for a few minutes and take a cool shower before going back inside. The first few days are the hardest but as the days go by you will be able to raise the temperatures and stay in longer. By the fourth week, you should be able to handle 30 minutes at 180-degrees. Below, I have added a sample four-week regimen that I have used every year.

6. Drink, drink, drink. It is extremely important to continuously hydrate inside the sauna in order to replace all the liquids you will be profusely sweating out. This will simulate the conditions you will be

facing in the desert and after three weeks the body will be able to efficiently process all the liquids it will be going to need.

I usually take in three 2-liter bottles of ice water. Two bottles are for drinking and the third is for rinsing the body; it acts as a coolant for a minute or so, which helps you stay in the sauna longer.

7. Time constraints. You may be pressed for time because of all the training. I suggest you taper on the mileage and hit the sauna or forget the run and just bake in the box.

Everyone has run more than enough at this point in time. Skip a run or two; the heat training is much more important. It will probably do you some good taking a day off. You will benefit more by spending some time getting blasted in the sauna.

8. Recovery. Immediately after the sauna I lay down on a bench in another room in order to let the body cool off. You will sweat again for ten to fifteen minutes while you reenter the normal world. Then take a nice long cool shower before continuing to hydrate for the rest of the day. Constant liquid intake is essential; drinking will enable you to start the next day fully hydrated and you will be able to continue to properly train.

9. Race Day. Pace yourself and make sure you wear a complete sun-protective suit and hat anytime the sun is out. It is much better if you keep the jacket and hat wet as suggested by Stephen Simmons. I have kept mine wet during the heat of the day and it has made an enormous difference. It probably cools you off by 10 or 20 degrees. My crew uses a super-soaker (large squirt gun) and blasts me with cold water every few miles. You will discover that if the suit gets dry it may keep out the ultra violent rays, but it also tends to retain the heat and you start baking inside. It is also best to keep the water from running

into your shoes because large ugly blisters will develop. If you get lucky, "The Blister Queen," Denise Jones can help you here.

## Art's Heat Training Schedule

| Day | Minutes in Sauna | Temperature |
|-----|------------------|-------------|
| 1   | 30               | 110         |
| 2   | 45               | 110         |
| 3   | 30               | 120         |
| 4   | 45               | 120         |
| 5   | 30               | 130         |
| 6   | 45               | 130         |
| 7   | 30               | 140 (steam) |
| 8   | 45               | 130         |
| 9   | 30               | 140         |
| 10  | 30               | 140 (steam) |
| 11  | 45               | 140         |
| 12  | 60               | 140         |
| 13  | 30               | 150         |
| 14  | Rest Re-hydrate  |             |
| 15  | 30               | 150         |
| 16  | 45               | 150         |
| 17  | 45               | 150         |
| 18  | 30               | 160         |
| 19  | 30               | 160         |
| 20  | 30               | 140 (steam) |
| 21  | Rest Re-hydrate  |             |
| 22  | 30               | 160         |
| 23  | 45               | 160         |
| 24  | 30               | 170         |
| 25  | 30               | 170         |
| 26  | 30               | 180         |
| 27  | 30               | 180         |
| 28  | 45               | 180         |

That's it. Other than a few days in the steam sauna all other days are in the dry sauna. Do the best you can and remember even a couple of weeks will help you out. Good Luck. It would be nice to see everyone finish this fantastic race.





## The Dangers of Hot Weather

**Running:** *Dehydration, Heat Cramps, Heat Exhaustion, Heatstroke and Hyponatremia*

By Claudio Piepenburg

(Originally published by Road Runner Sports)

Running in hot weather can pose dangers to runners. Particularly dangerous is racing in hot, humid summer conditions. Here's how to protect yourself from these five serious (and potentially fatal) conditions.

### Dehydration

Dehydration is not limited only to the summer months, although it's probably more likely to occur during that time. Many physicians believe that most people are in a constant state of dehydration. Since coffee, tea, soda and alcohol act as a diuretic, anyone who drinks these fluids on a daily basis, and doesn't drink at least an equal amount of water, will probably be dehydrated. If the person is physically active, the potential for dehydration is even greater.

Working out in hot, humid conditions promotes sweating, which in turn can cause dehydration. Sweating is good for you because it cools your body, but when you lose too much water you become dehydrated. If you're already slightly dehydrated, sweating will only make it worse. It's important to maintain an adequate fluid intake all the time. Don't expect that you can make up for several days of not drinking enough by downing two cups of sports drink before your next long run or race. It's important to keep hydrated all the time. Once you start to feel thirsty, it's too late.

The average (sedentary) person needs a minimum of eight 8-ounce glasses of fluid a day. Runners need more: anywhere from four to eight quarts of fluid. That translates to at least sixteen 8-ounce glasses daily. Remember that diuretics don't count!

Drink water and sports drinks, and if you don't have to worry about calories, fruit drinks or juice.

Two hours before your daily summer workout or a race, you should drink 16 ounces of fluid. Then ten minutes or so before you start to run, drink another one or two cups of water or sports drink. Drinking early and drinking often is the key. During a race you should drink six to twelve ounces of fluid every 15-20 minutes. If the weather is very hot, you may need to drink even more. Training in warm weather, you should drink at least every 35 to 40 minutes. (Remember you will have already had two 8-ounce glasses before you started.) If you're running a race shorter than 30 minutes, you probably won't need any water other than what you drank before the start. The same goes for the last few miles of a longer race. If you're racing or training for longer than an hour, drink sports drinks as opposed to strictly water.



Christopher Rampacek - 2001

Start drinking immediately after finishing a run, no matter if it was a race or a workout. Minimum is 16 ounces for every 30 minutes you ran. If you tend to sweat a lot, you'll need more. Weigh yourself after you've run. Drink at least 16 ounces of fluid for every pound you lose through sweating.

By monitoring the color of your urine you can tell if you're hydrated. It should be pale yellow or even clear. If it isn't, you

need to drink more fluids. It's important that you retain the fluid, so be careful if you're urinating every fifteen or twenty minutes. To restore your fluid balance, eat something salty (a bag of pretzels, salted nuts, crackers or potato chips), then drink a sports drink. The salt will make you thirstier, so you'll take in even more fluid and urine production will decrease.



PHOTO: TONY DIZINNO

Marshall Ulrich - 2000

## Heat Cramps

Have you ever seen a runner bent over at the side of the road massaging their calves during a race? Chances are that he or she had heat cramps. Heat cramps are very painful (envision someone stabbing a knife deep into your muscles!) and rarely "work themselves out". The cramps occur because you've lost minerals through sweating and dehydration. Once you've reached the point of heat cramps, it's too late to try to replace fluids on the run. To make the cramps go away you should:

- Stop running
- Drink fluids immediately. The fluids should include sports drinks as well as water
- Massage the muscles once the pain begins to subside
- Cool your body with wet towels
- Get out of the sun

## Heat Exhaustion

Heat exhaustion is a very serious condition that can lead to heatstroke. The symptoms of heat exhaustion are:

- Dizziness
- Goose bumps (especially the torso & arms)
- Nausea (sometimes accompanied by vomiting)
- Moderate to severe headache
- Weak legs
- Lack of coordination
- Rapid pulse
- Heavy sweating often accompanied by moist and cold skin
- Muscle cramping

If you experience any of these symptoms you must:

- Stop running immediately
- Get medical attention
- Drink large amounts of fluids, including sports drinks
- Get out of the sun
- Lie down and elevate your feet above your heart
- Loosen your clothing

## Heatstroke

Heatstroke can be fatal. Unfortunately runners will sometimes ignore the symptoms of heat exhaustion (particularly in races longer than 10K) and will continue to push themselves until they're nearing a total thermoregulatory breakdown. The symptoms of heatstroke are very similar to those of heat exhaustion, but rapidly progress to:

- Disorientation
- Weakness in the legs to the point that the runner may fall
- Strange behavior (including flailing with the arms and shoving)
- "Fuzzy" thinking
- Rapid pulse
- Cessation of sweating and hot/dry skin
- Body temperature that may reach 104 degrees or higher
- Lack of consciousness
- Convulsions or seizures
- Coma

Someone suffering from heatstroke needs immediate medical attention. They should be moved out of the sun, cooled by either rubbing their body with ice or immersing them in cold water and given fluids intravenously.

## Hyponatremia

Within the last few years the condition known as hyponatremia has begun to attract the attention of sports medicine physicians, exercise physiologists, and the medical directors at some of the larger marathons around the country. Hyponatremia has been called water intoxication because of the symptoms it produces. According to Dr. Tim Noakes, Professor of Exercise & Sports Science Director at the University of Cape Town, "...a person with hyponatremia looks like he or she is mildly drunk. They can't concentrate normally...they forget what you were talking about and start to concentrate elsewhere."

Hyponatremia occurs when the body becomes dangerously low in sodium. It's caused when you literally take in too much water. Although scientists have known about it for a long time, it has only been in the last few years as more runners have been competing in marathons that it has become a concern. According to Dr. Noakes, fluid has to be ingested at high levels for several hours for hyponatremia to occur. He suggests that a runner would have to be drinking water regularly for at least four to six hours to develop the condition. So runners taking four to six hours or more to run a marathon are at particular risk.

Unfortunately, symptoms of hyponatremia tend to mimic those of severe dehydration and/or heat exhaustion. By giving the athlete more water to drink the hyponatremia becomes worse, as more and more sodium is flushed out of the system. If a runner with hyponatremia is given fluids intravenously, they can suffer a fatal reaction. Dr. Noakes and other sports medicine professionals recommend that physicians

and other medical personnel at road races be alert for the signs of hyponatremia. One of the earliest symptoms is a craving for salty food.

Although hyponatremia is rare, it's wise to be aware that it can occur, particularly if you're running a marathon in unusually hot weather. Hyponatremia serves as a reminder that water is good, but don't forget sports drinks, which replenish your body with the sodium, potassium and other trace minerals you lose through sweat. It's worth repeating: if you're going to be running (or racing) for longer than an hour, you should be drinking a sports drink as well as water.

*About the author:* Claudia Piepenburg has been running for 21 years and is the current editor for Peak Run Performance. She holds or has held state age-group records in Michigan, North Carolina, Florida, Tennessee and Virginia. In 1990, she was ranked 18th fastest masters woman in the world and 8th fastest masters woman in the U.S. in 1990 and 1991. She competed in the 1988 Olympic Marathon Trials, was 20th woman overall in the 1987 Boston Marathon and women's winner of the 1986 Virginia Beach Marathon. If you have questions or comments for Claudia, she can be reached at [cpiepe@roadrunnersports.com](mailto:cpiepe@roadrunnersports.com).



## The Death Valley Cup

The Death Valley Cup recognizes male and female athletes who complete both the Badwater Ultramarathon and the Furnace Creek 508 (a 508 mile bicycle race) in the same calendar year. This is a form of recognition for those athletes who complete both races in the same year, and also an actual plaque that is awarded each time an athlete breaks the current overall record for either the men's or women's divisions. Thus, there are, at any given moment, two Death Valley Cup Record Holders, as well as an ongoing, slowly increasing list of Death Valley Cup Finishers. To earn this recognition is a very significant achievement in endurance sports and especially for those athletes who have come to know and love Death Valley and its environs.



PHOTO: CHRIS KOSTMAN

Angelika Castaneda, 1999

### Current Death Valley Cup Record Holders

Kaname Sakurai, 36, Nagoya, Japan  
 2000 Badwater, 27:52:14, 3rd place  
 2000 Furnace Creek, 32:31:56, 2nd place  
 =60:24:10 total time\*

Angelika Castaneda, 56, San Diego, CA  
 1999 Badwater, 36:58, 1st place  
 1999 Furnace Creek, 43:46:40, 3rd place  
 =80:44:40 total time\*

### Death Valley Cup Finishers

Marshall Ulrich, Ft. Morgan, CO  
 1996 Badwater, 33:01, 1st place  
 1996 Furnace Creek, 38:32:45, 16th place  
 =71:33:45 total time

David Jackson, Lexington, KY  
 2002 Badwater, 47:12:30, 25th place  
 2002 Furnace Creek, 38:56:12, 15th place  
 =86:08:42 total time

Del Scharffenberg, Portland, OR  
 1997 Badwater, 48:16, 13th place  
 1997 Furnace Creek, 42:15:26, 10th place  
 =90:31:26 total time

Charlie Liskey, Somis, CA  
 1996 Badwater, 58:26, 14th place  
 1996 Furnace Creek, 39:32:08, 17th place  
 =97:58:08 total time

*(\*To receive the Death Valley Cup plaque, these combined record times must be broken.)*

For information on Furnace Creek 508, visit [www.the508.com](http://www.the508.com).



## OFFICIAL RULES

### General Race Rules

1. There are three starting times for the 2003 Badwater Ultramarathon (6am, 8am, and 10am on July 22, 2003), but all racers in all groups are competing in the same race. Runners may attend only their assigned start time. Runners must check in at the start line, ready to race, 30 minutes prior to their start time. Starting Groups are assigned by the race director and are non-transferable. Split times will be collated throughout the race to maintain overall standings. There are only two divisions: men's and women's. The racer to arrive at the finish line in each division with the lowest overall time, based on their starting time, will be considered the winner.

2. The race number must be worn unmodified, unfolded, and visible at all times during the race.

3. The clock does not stop for any reason until the course officially closes 60 hours after each official start time.

4. Running must always be on the far left side of the road or off the left side of the road, facing traffic (pacers, too).

5. Racers must make their presence known at all Time Stations located in fixed locations along the route. Runner times in and out of the Time Station will be recorded. Racer locations, time splits, and places will only be revealed at Time Stations.

6. The race ends at the Mt. Whitney Portals. If you choose to hike to the summit, please remove any official race logos. Be sure to have the appropriate permits from the Forest Service.

7. Racers, crew, and staff must not litter, mar, or pollute the landscape or environment.

8. All racers, crew and staff must display courtesy, good taste, decorum, and sportsmanship at all times. Nudity is specifically not allowed.



PHOTO: CHRIS KOSTMAN

Al Arnold congratulates 2002 men's winner Darren Worts and crew.

### Legal and Bureaucratic Issues

1. All racers must follow and complete the entire application and entry process, filling out all forms and paying all necessary fees.

2. All racers must sign the Entrant Contract.

3. All racers and crew must sign the Accident Waiver and Release of Liability / Release of Name and Likeness

4. All race vehicles must meet the minimum requirements of property damage and personal injury liability automobile insurance for the state of California. All vehicle drivers must be fully licensed.

5. All racers and at least one of their crew members must attend all of the Pre-Race Meeting. Those racers who do not attend the meeting will not be allowed to participate. No exceptions.



6. All racers must be willing to submit to a drug urine test before, during, or after the race. If any banned substances are detected, the racer will be disqualified from competition and the final standings of the race itself.

7. No TV, film, or video crew, person, producer, director or other broadcast media representative may accompany or cover any racer or the race itself without the specific written permission of the Race Director. All film crews must sign a Non-Exclusive Licensing Agreement and pay a Rights Fee. Additionally, Death Valley National Park will also require payment of a filming fee and signature of a filming agreement.

8. All racers and crew must pay the Death Valley National Park Entrance Fee of \$5 per person. Proof must be brought to Runner Check-In on July 21 or racers will have to pay the entrance fees for the entire group at that time.



PHOTO: CHRIS KOSTMAN

Steven Silver and crewmember - 2001

9. All entrants must bring one U.S. dollar (or more) in a sealed envelope to the pre-race meeting. Please write the runner number on the envelope. This envelope will not be returned.

## Support Crew

1. Each racer must have a support crew comprised of at least one four-wheeled motor vehicle and two crew members at all times. Each racer must have his or her own personal support crew and vehicle; crew and support vehicles may not be shared, except informally in the spirit of the event, i.e., crews may lend assistance to other racers or crews.

2. Runners must progress under their own power without drafting, helping, or any other type of physical assistance.

3. Runners may not be accompanied by more than one pacer, either on foot or bicycle, at any given time. Additional crew members that are handing off supplies to the runner and/or pacer must be off the roadway at all times (i.e. left of the white line on the shoulder).

4. Runners must not run abreast with other runners or with pacers on the roadway. All running must be single-file on the roadway. If runners or pacers want to run next to one another, they must be OFF the roadway, i.e. left of the white line.

5. Crewmembers may not use illegal drugs, stimulants, or dope, as well as alcohol of any kind, during the race or at any race events or activities.

6. Runners under the age of 60 may not be accompanied by pacers or moving crew members between Badwater and Furnace Creek.

## Support Vehicles

1. The support vehicle may not be wide than 78" in width, as stated in the manufacturer specifications. Small Cars, Minivans, and SUVs are recommended. All motorhomes, RVs, oversize SUVs,

vans, and trucks, or other types of oversize vehicles are strongly discouraged, even as a secondary support vehicle. Also, if a racer has only one support vehicle, it may not be wider than 78".

2. All support vehicles must have their headlights on whenever the engine is running, 24 hours a day.

3. All race vehicles must have highly visible signage on the back of the vehicle stating "CAUTION RUNNERS ON ROAD." This type of sign can be made, for example, using yellow, white, or pink adhesive shelf paper with at least 6 inch letters. Magnetic, reflective, professionally made signs for this purpose may be made to order by a local sign shop. Additionally, all runners will receive a race-legal caution sign at Runner Check-In that may be used as well or instead.

4. All support vehicles must have their racer's name and race number easily visible on all four sides. This type of sign can be made, for example, using yellow, white, or pink adhesive shelf paper with at least 6 inch letters. This should be done in advance of coming to Death Valley.

5. Vehicle windows may not be blocked or obstructed with any signage.

6. Only one support vehicle is allowed for each racer at the Start Line before the race and between the Start Line and Furnace Creek during the race. This support vehicle may not be an RV or motorhome. No RVs or motorhomes are allowed between the Start Line and Furnace Creek.

7. No RVs or motorhomes are allowed between the Lone Pine and the Finish.

8. Vehicles must "leapfrog" the runner at all times. Attempt to make each "leapfrog" at least one mile or more in length.

Racers may not be "shadowed" and vehicles must not "caravan." Driving may never be at the speed of any racer. Driving must be done at the speed of traffic, never slowing down to encourage, talk to, or lend assistance to any racer while moving. All assistance must be provided by pedestrian crew members; handing off of supplies from the vehicle is not allowed.

9. Vehicles must be parked completely off the road surface whenever they are stopped (with all four tyres right of the white line). Many areas of the route have very little shoulder for parking so care must be taken in choosing stopping places. When stopping/parking, vehicles may not stop on the left side of the road. All stopping/parking must be on the right side of the road.



PHOTO: TONY DIZINNO

10. All vehicles must obey the vehicle code laws of California at all times.

## Safety and Medical Issues

1. Remember, at all times and in all situations, safety is the most important issue. This means safety for racers, crew, staff, and the general public. The roads are not closed for this event and are, in fact, quite busy with tourist and local traffic.

2. I.V.s (intravenous fluids) are not permitted during the race. If a racer receives an I.V. during the race, then that racer is disqualified and may not complete the course officially.

3. Racers and crew members/pacers must wear reflective material facing in all four directions, as well as blinking LED lights facing front and rear, at night. Racers and crewmembers are encouraged to wear reflective material during the day as well. We recommend the outstanding products from 9Lives Products, Inc.

4. Racers are responsible for both their own and their crew's actions; crews are responsible for both their own and their racer's actions.

5. Always look and listen both ways before crossing the highways. Remember that drivers will not expect to encounter a racer or parked vehicle out on the course. Remember you are on public roads. Racers should not cross over the highway more than necessary; crew should cross the highway carefully to bring assistance to their racer.

6 All entrants and crew must study "Medical Risks in the Badwater Ultramarathon" and "The Dangers of Hot Weather Running".

### Leaving the Course or Withdrawing

1. Every inch of the course must be traveled by each racer. In the event of a routing error, e.g., wrong turn, the competitor may be driven back to the exact original spot where he/she left the course and continue running from that location. There will be no allowance made for lost time or miles run in the wrong direction.

2. If a racer needs to leave the course, his/her crew must note the exact location with a numbered stake in the ground.

This ground must be visible from the road in both directions. The racer must then resume the race from the same place that he/she left it. The numbered stakes will be provided to all runners at Runner Check-In. Racers may only leave the course for appropriate reasons such as rest or medical attention. Focus must be kept on the speedy completion of the course.

3. If a racer withdraws, he/she or his/her crew must contact Race Headquarters or a Time Station immediately. Name, reason for withdrawal, time of withdrawal, and miles completed must be stated. All racers and crew who drop are encouraged to come to the finish line and both post-race events to greet and celebrate with their fellow racers and crew.

4. All Emergency Evacuation costs for participants or crews will be borne by that person or their heirs. The race organizers are in no way liable or responsible for emergency evacuation.

### Awards

1. All racers who begin the event will receive a Badwater Ultramarathon race t-shirt, hat, and Badwater Race Magazine.

2. All racers who officially complete the event within 60 hours will a commemorative certificate, a finisher's medal, and a finisher's t-shirt. Certificates and t-shirts will be mailed after the race.

3. All racers who officially complete the course within 48 hours will receive a commemorative Badwater Ultramarathon buckle. Buckles will be mailed after the race.

### Rule Enforcement and Penalties

1. Race rules are designed to provide a safe and fair experience for everyone involved.

2. Major rule infractions by racers or their crew, especially those regarding "cheating," will result in immediate disqualification of the racer.

3. Other, lesser offenses will result in the following cumulative time penalties:

**First Penalty: One hour**

**Second Penalty: Disqualification**

4. Time penalties are imposed by stopping at the final Time Station in Lone Pine to serve his/her time. The race and clock will continue while the penalized racer waits out his/her penalty time. A Race Official will be present to oversee this process.

5. The Race Director has the authority to overrule any rule or invent a new rule based on extenuating circumstances. The Race Director has ultimate authority in regards to all rules, their interpretation, and their enforcement. There is no "appeals committee" or "appeals process."

### Finally

1. Have fun and keep smiling!

### In Memoriam:

#### Scott McQueeney, 1955-2003

It is with a heavy heart that I must report that Badwater 2000 veteran and Badwater 2002 staffer Scott McQueeney, age 47, has passed away, just seconds after crossing the finish line of a 50k event in his home state of Oregon.

Scott was a good man and a great friend to our race. He ran and hosted the best Badwater "fan website" at [www.run2xs.com](http://www.run2xs.com) and he was also a fantastic father. His daughter, Shannon, had been battling cancer and he did so very much to support her, such as running a marathon backwards, building a special online diary website for her, and bringing her to Badwater 2002 with his wife and her mother, Vivian. He did the latter so that she could be a part of the event and so that she could cross the finish line with fellow cancer survivor, Rick Nawrocki. Scott, Shannon, and Vivian were integral to the success of the 2002 race and Scott played a vital role in running our best-ever webcast. Scott will be sorely missed. We extend our condolences to his family and ask that all of you do the same.

Checks for Shannon's college fund can be made to Shannon McQueeney and sent directly to her home address. The checks will be deposited in the college account:

Vivian / Shannon McQueeney  
306 Jefferson St., Oregon City, OR 97045

For more information, visit [www.badwaterultra.com/2003web/mcqueeney.html](http://www.badwaterultra.com/2003web/mcqueeney.html)



Photo: Scott (Right) with family and friends at Panamint Springs during the 2002 race.

## Badwater Ultramarathon Official Race Route

| <i>Landmark</i>                  | <i>Mile</i> | <i>Elev.</i> |                                                   |
|----------------------------------|-------------|--------------|---------------------------------------------------|
| Badwater                         | 0           | -282         |                                                   |
| Telescope Peak Sign on L.        | 1.8         | -200         |                                                   |
| Wide Shoulder on R.              | 3.1         | -200         |                                                   |
| Natural Bridge on R.             | 3.5         | -170         |                                                   |
| Devil's Golf Course on L.        | 5.5         | -165         |                                                   |
| Artist's Drive entry on R.       | 7.9         | -165         |                                                   |
| West Side Road on L.             | 10.5        |              |                                                   |
| Artist's Drive exit on R.        | 11.6        | -70          |                                                   |
| Mushroom Rock on R.              | 12.9        | -170         |                                                   |
| Golden Canyon on R.              | 14.4        | -165         |                                                   |
| Hwy 190 & 178 – Go Left          | 16.4        | 0            |                                                   |
| <b>Furnace Creek Ranch on L.</b> | <b>17.4</b> | <b>-165</b>  | <b>-First Time Station on Left after entrance</b> |
| Chevron Gas and ice on L.        | 17.6        | -165         |                                                   |
| Visitor's Center on L.           | 17.7        | -170         |                                                   |
| Harmony Borax Works on L.        | 19.0        | -170         |                                                   |
| Cow Creek on R.                  | 20.7        | -170         |                                                   |
| <i>1st Marathon</i>              | <i>26.2</i> | <i>-170</i>  |                                                   |
| Beatty, NV turnoff on R.         | 28.3        | -165         |                                                   |
| Salt Creek turnoff on L.         | 30.7        | -165         |                                                   |
| Sea Level Sign on L.             | 31.9        | 0            |                                                   |
| Scotty's Castle turnoff on R.    | 34.7        | -130         |                                                   |
| Sea Level Sign on L.             | 35.2        | 0            |                                                   |
| Sand Dunes turnoff on R.         | 35.8        | 0            |                                                   |
| Devil's Cornfield sign on R.     | 36.1        | -80          |                                                   |
| Sand Dunes on R.                 | 39.9        | 0            |                                                   |
| <b>Stovepipe Wells Village</b>   | <b>41.9</b> | <b>0</b>     | <b>-Second Time Station on Right before Store</b> |
| Mosaic Canyon turnoff on L.      | 42.1        | 5            |                                                   |
| 1000' elevation sign             | 46.6        | 1000         |                                                   |
| 2000' elevation sign             | 50.5        | 2000         |                                                   |
| Wild Rose turnoff on L.          | 51.0        | 2500         |                                                   |
| <i>2nd Marathon</i>              | <i>52.4</i> | <i>2800</i>  |                                                   |
| 3000' elevation sign on L        | 53.3        | 3000         |                                                   |
| 4000' elevation sign on L.       | 55.7        | 4000         |                                                   |
| 2nd Radiator Water Tank on R.    | 58.5        | 4900         |                                                   |
| Townes Pass summit               | 58.7        | 4965         |                                                   |
| 4000' elevation sign on R.       | 61.5        | 4000         |                                                   |
| Vista Point (view of Whitney)    | 62.2        | 3500         |                                                   |
| 3000' elevation sign on L.       | 63.8        | 3000         |                                                   |
| 2000' elevation sign on L.       | 66.1        | 2000         |                                                   |
| Adopt-a-Highway sign on R        | 67.7        | 1800         |                                                   |
| Panamint lake bed, east edge     | 68.1        | 1640         |                                                   |
| Panamint lake bed, west edge     | 69.1        | 1640         |                                                   |
| Trona turnoff on L.              | 69.8        | 1750         |                                                   |
| <b>Panamint Springs Resort</b>   | <b>72.3</b> | <b>1970</b>  | <b>-Third Time Station on Left at Resort</b>      |





|                                 |              |             |                                                   |
|---------------------------------|--------------|-------------|---------------------------------------------------|
| 2000' elevation sign on L.      | 72.9         | 2000        |                                                   |
| Darwin Falls turnoff            | 73.3         | 2500        | <b>-Dangerous, narrow area! - miles 74 to 81*</b> |
| 3000' elevation sign on L.      | 75.8         | 3000        |                                                   |
| <i>3rd Marathon</i>             | <i>78.6</i>  | <i>3400</i> |                                                   |
| 4000' elevation sign on L.      | 80.2         | 4000        |                                                   |
| Father Crowley's Point on R.    | 80.2         | 4000        |                                                   |
| DVNP Park Boundary              | 84.9         | 4200        |                                                   |
| Saline Valley turnoff on R.     | 86.0         | 4800        |                                                   |
| 5000' elevation sign            | 87.0         | 5000        |                                                   |
| <b>Darwin turnoff on L</b>      | <b>90.1</b>  | <b>5050</b> | <b>-Fourth Time Station on Left at turnoff</b>    |
| 5000' elevation sign on L.      | 92.4         | 5000        |                                                   |
| Grave Site on R.                | 96.3         | 4100        |                                                   |
| 27.5 mile post marker           | 100.0        | 4050        |                                                   |
| 4000' elevation sign on L.      | 101.6        | 4000        |                                                   |
| Hwy 136 & 190 – go straight     | 102.9        | 3935        |                                                   |
| <i>4th Marathon</i>             | <i>104.8</i> | <i>3800</i> |                                                   |
| Keeler                          | 107.8        | 3610        |                                                   |
| Adopt-a-Highway sign on R.      | 108.5        | 3605        |                                                   |
| Dolomite loop turnoff on R.     | 112.6        | 3600        |                                                   |
| Dolomite loop turnoff on R.     | 116.9        | 3610        |                                                   |
| Owen's River                    | 117.7        | 3610        |                                                   |
| Hwy 190 & 395 – go Right        | 120.3        | 3695        |                                                   |
| <b>Dow Villa Hotel on Right</b> | <b>122.3</b> | <b>3610</b> | <b>-Fifth Time Station on Right at Dow Villa</b>  |
| Portal Road light – go Left     | 122.4        | 3610        |                                                   |
| Tuttle Creek turnoff on L.      | 122.9        | 3770        |                                                   |
| LA Aqueduct                     | 123.0        | 3855        |                                                   |
| Lone Pine Creek                 | 124.1        | 4200        |                                                   |
| Movie Flat Road on R.           | 125.1        | 4590        |                                                   |
| Lone Pine Creek                 | 125.3        | 4800        |                                                   |
| Horseshoe Meadow on L.          | 125.5        | 5000        |                                                   |
| Cuffe Ranch turnoff on R.       | 126.7        | 5100        |                                                   |
| Olivas Ranch turnoff on L.      | 128.0        | 5300        |                                                   |
| Lone Pine Campground on L.      | 129.0        | 5700        | <b>-Dangerous, narrow area! - miles 129 -135*</b> |
| Lone Pine Creek                 | 129.2        | 6000        |                                                   |
| Inyo Nat. Forest sign on R.     | 129.5        | 6400        |                                                   |
| Large pullout on R.             | 130.8        | 6890        |                                                   |
| <i>5th Marathon</i>             | <i>131.0</i> | <i>7000</i> |                                                   |
| Switchback to left              | 131.7        | 7215        |                                                   |
| Vista Point                     | 132.4        | 7400        |                                                   |
| "Campsites 39-44" sign on R     | 133.3        | 7700        |                                                   |
| Meysan Lakes trailhead on L.    | 133.5        | 8035        |                                                   |
| Family Campsites                | 133.7        | 8100        |                                                   |
| Overflow Parking                | 134.3        | 8200        |                                                   |
| <b>Finish</b>                   | <b>134.4</b> | <b>8360</b> |                                                   |

Official distance is 135.0 miles. Remember all car odometers have error. Distances above are accurate in a relative sense, but you may find variation in the overall distance, as we did when creating the above routesheet

**\*No slowing down or stopping except in proper pullouts**

## Course Description

### Badwater, Death Valley

The race begins here adjacent to a pool of saltwater located at the lowest place in the United States. Runners must check in 30 minutes before their start time.

### Furnace Creek Ranch, Mile 17.4

The first oasis in our journey. A gas station, small general store, motel, campsites, and ice machine await us there.

### Stove Pipe Wells, Mile 41.9

A small market, gas station, restaurant and motel. This is not open 24 hours.

### Townes Pass (4956'), Mile 58.7

Long ascent, then long descent, followed by approx. 12 long straight miles. Steep & narrow road with limited opportunities to park. Support vehicles, crews, and runners must be cautious and extra aware of the traffic.

### Panamint Springs Resort, Mile 72.3

Restaurant and motel with limited hours. Long, steep climb ahead. Steep & narrow road with limited opportunities to park.

Support vehicles, crews, and runners must be cautious and extra aware of the traffic.

### Father Crowley's Turnout, Mile 80.2

Road continues to rise to 5000' over rolling hills to summit, then descends into Owen's Valley.

### Keeler, Mile 107.8

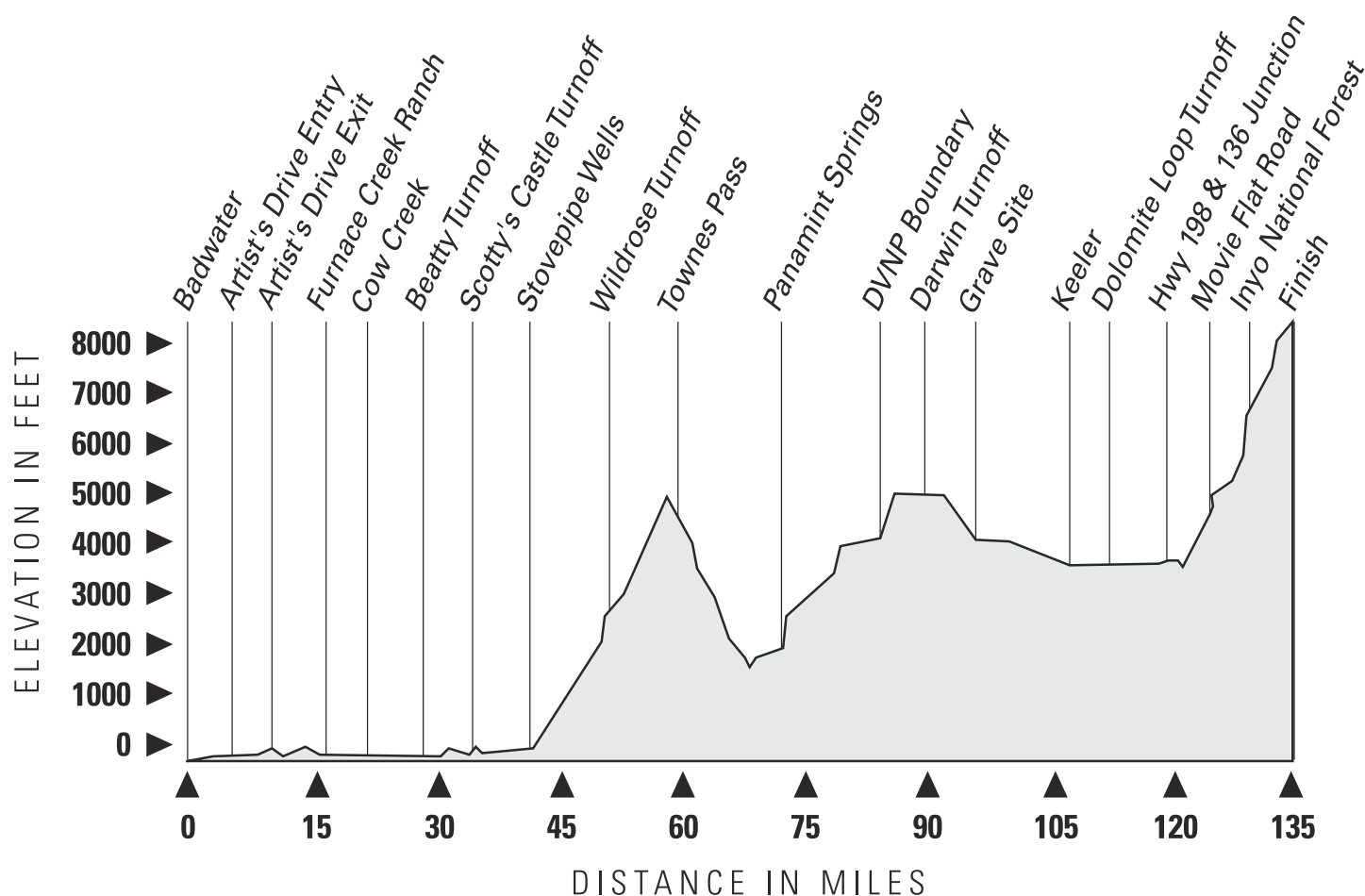
A small mining town with no facilities.

### Lone Pine, Whitney Portal Road, Mile 122.2

Lone Pine offers the weary runner/crew fast food, pizza, restaurants, motels, gas stations, grocery stores, etc. Restock here for the climb to the portals. Turn left onto the Whitney Portal Road to begin the final leg, the longest & steepest climb of the race. Temperatures will steadily decrease. Be prepared with extra layers of clothing and rain gear the final few miles. Be sure your support vehicle is completely off of the road and that you do not block traffic.

### Mt. Whitney Trailhead, (8360'), Mile 135

Congratulations! You have finished the most extreme ultra in the world! A small diner/shop are open daylight hours. There is also a stocked fishing pond and a campground.



### Rough Course Profile Stats

#### 69 Flat Miles

Badwater to Stovepipe: 41

Panamint floor: 2

Darwin flats: 4

Owens Valley to Lone Pine: 22

#### 46 Uphill Miles

Stovepipe to Townes: 18

Panamint grade (west): 15

Lone Pine to Whitney Portals: 13

#### 20 Downhill Miles

Townes Pass to Panamint Valley: 8

Darwin to Owens Valley: 12



PHOTO: CHRIS KOSTMAN

Marine Corp's finest: Curt Maples and Mark Johnson, 2002 finishers.

| Bib # | M/F | First | Last | Age | Home Town | State | Nationality | History |
|-------|-----|-------|------|-----|-----------|-------|-------------|---------|
|-------|-----|-------|------|-----|-----------|-------|-------------|---------|

**6:00 AM START**

|    |   |             |            |    |                  |    |            |         |
|----|---|-------------|------------|----|------------------|----|------------|---------|
| 45 | F | Bonnie      | Busch      | 45 | Bettendorf       | IA | USA        | Rookie  |
| 68 | F | Patricia    | Cook       | 51 | Warrensburg      | MO | USA        | Rookie  |
| 5  | F | Anita Marie | Fromm      | 32 | Quartz Hill      | CA | USA        | Veteran |
| 36 | F | Gillian     | Robinson   | 36 | Mountain View    | CA | UK         | Rookie  |
| 60 | M | Chet        | Blanton    | 44 | Honolulu         | HI | USA        | Rookie  |
| 67 | M | Jim         | Bodoh      | 50 | Tampa            | FL | USA        | Rookie  |
| 4  | M | Adam        | Bookspan   | 37 | No. Miami Beach  | FL | USA        | Veteran |
| 6  | M | Ruben       | Cantu      | 60 | Santee           | CA | USA        | Veteran |
| 54 | M | Conrad      | Daniel     | 54 | Redlands         | CA | USA        | Rookie  |
| 33 | M | Greg        | Eason      | 33 | Little Rock      | AR | USA        | Rookie  |
| 71 | M | Ken         | Eielson    | 54 | Glenwood Springs | CO | USA        | Rookie  |
| 72 | M | Dave        | Goodwin    | 55 | Fresno           | CA | USA        | Rookie  |
| 64 | M | Norman      | Haines     | 64 | Palm Desert      | CA | USA        | Rookie  |
| 70 | M | Ben         | Jones      | 70 | Lone Pine        | CA | USA        | Veteran |
| 73 | M | Dimitri     | Kieffer    | 37 | Seattle          | WA | France     | Rookie  |
| 57 | M | Roger       | Klein      | 57 | Hassel           | -  | Luxembourg | Rookie  |
| 41 | M | Don         | Lundell    | 41 | Boulder Creek    | CA | USA        | Veteran |
| 74 | M | Dan         | Marinsik   | 44 | San Jose         | CA | USA        | Rookie  |
| 75 | M | Ian         | Parker     | 52 | Irvine           | CA | USA        | Veteran |
| 62 | M | Dave        | Remington  | 62 | Spokane          | WA | USA        | Veteran |
| 63 | M | Marvin      | Snowbarger | 66 | San Jose         | CA | USA        | Rookie  |
| 12 | M | Charles     | Vincent    | 43 | Monaco           |    | Monaco     | Veteran |

**8:00 AM START**

|     |   |                |            |    |                 |                 |         |         |
|-----|---|----------------|------------|----|-----------------|-----------------|---------|---------|
| 48  | F | Jane           | Ballantyne | 48 | North Vancouver | BC              | Canada  | Rookie  |
| 49  | F | Louise         | Cooper     | 49 | West Hills      | CA              | USA     | Veteran |
| 58  | F | Barbara A.     | Elia       | 58 | Modesto         | CA              | USA     | Veteran |
| 100 | F | Lisa           | Henson     | 42 | Oakland         | CA              | USA     | Rookie  |
| 27  | F | Mary           | Kashurba   | 47 | Somerset        | PA              | USA     | Rookie  |
| 29  | F | Janice I.      | Levet      | 52 | Pollock Pines   | CA              | USA     | Rookie  |
| 53  | F | Nancy          | Shura      | 53 | Northridge      | CA              | USA     | Rookie  |
| 76  | M | Patrick        | Cande      | 46 | Papeete         | Tahiti          | France  | Rookie  |
| 31  | M | Mark           | Cockbain   | 31 | East Hunsbury   | Northampton, UK |         | Rookie  |
| 42  | M | Michael M.     | Doppelmayr | 42 | Hallein         | -               | Austria | Veteran |
| 22  | M | Christopher K. | Hendley    | 40 | Las Vegas       | NV              | USA     | Veteran |
| 26  | M | Mike           | Karch      | 34 | Arroyo Hondo    | NM              | USA     | Rookie  |
| 28  | M | William        | LaDieu     | 53 | Harrisburg      | PA              | USA     | Rookie  |
| 56  | M | Bill           | Lockton    | 55 | Santa Monica    | CA              | USA     | Rookie  |



|    |   |                 |               |    |              |                    |        |         |
|----|---|-----------------|---------------|----|--------------|--------------------|--------|---------|
| 24 | M | Jean Jaques     | Merienne      | 50 | Chamiers     | -                  | France | Veteran |
| 18 | M | Blade           | Norman        | 43 | Arlington    | TX                 | USA    | Rookie  |
| 35 | M | Nathan          | Ochsner       | 35 | Katy         | TX                 | USA    | Veteran |
| 50 | M | Keith Alan      | Peterson      | 50 | Portland     | OR                 | USA    | Veteran |
| 46 | M | Joe             | Prusaitis     | 48 | Austin       | TX                 | USA    | Rookie  |
| 51 | M | Dr. Christopher | Rampacek      | 51 | Houston      | TX                 | USA    | Veteran |
| 78 | M | Wayne           | Simpson       | 42 | Leeds        | West Yorkshire, UK |        | Rookie  |
| 79 | M | Andy            | Velazco       | 55 | Jonesboro    | GA                 | USA    | Rookie  |
| 80 | M | Jean Pierre     | Vozel         | 48 | Leguevin     | -                  | France | Rookie  |
| 65 | M | Charles F.      | Waskevich, Jr | 54 | Millburn     | NJ                 | USA    | Rookie  |
| 9  | M | Scott           | Weber         | 50 | Breckenridge | CO                 | USA    | Veteran |

## 10:00 AM START

|    |   |                 |               |    |                      |        |             |         |
|----|---|-----------------|---------------|----|----------------------|--------|-------------|---------|
| 98 | F | Tracy           | Bahr          | 31 | Deschutes            | OR     | USA         | Rookie  |
| 1  | F | Pamela J.       | Reed          | 42 | Tucson               | AZ     | USA         | Veteran |
| 17 | F | JodyLynn        | Reicher       | 40 | Midland Park         | NJ     | USA         | Veteran |
| 3  | F | Monica          | Scholz        | 36 | Jerseyville          | Ont    | Canada      | Veteran |
| 7  | F | Lisa R.         | Smith-Batchen | 42 | Victor               | ID     | USA         | Veteran |
| 10 | M | Rudy            | Afanador      | 44 | Medford              | NY     | USA         | Veteran |
| 47 | M | Jay             | Anderson      | 47 | Buena Park           | CA     | USA         | Veteran |
| 37 | M | Christopher     | Bergland      | 37 | New York             | NY     | USA         | Rookie  |
| 2  | M | Jay             | Birmingham    | 57 | Blair                | NE     | USA         | Veteran |
| 44 | M | Sergio          | Cordeiro      | 49 | Brasilia             | DF     | Brazil      | Rookie  |
| 34 | M | Joseph A        | DeSena        | 34 | New York             | NY     | USA         | Rookie  |
| 40 | M | Charlie         | Engle         | 40 | Summerfield          | NC     | USA         | Rookie  |
| 8  | M | Luis James      | Escobar       | 40 | Santa Maria          | CA     | USA         | Rookie  |
| 66 | M | Eberhard        | Frixe         | 53 | Meine, Niedersachsen |        | Germany     | Veteran |
| 52 | M | Chris           | Frost         | 52 | Malibu               | CA     | USA         | Veteran |
| 39 | M | Luis            | Guerrero      | 39 | Mexico City          | -      | Mexico      | Rookie  |
| 23 | M | Bob             | Haugh         | 52 | Paducah              | KY     | USA         | Rookie  |
| 21 | M | Jürgen          | Hofmann       | 51 | Eisenberg            | -      | Germany     | Veteran |
| 15 | M | Mick            | Justin        | 55 | Nisswa               | MN     | USA         | Veteran |
| 20 | M | Scott           | Ludwig        | 48 | Peachtree City       | GA     | USA         | Rookie  |
| 13 | M | W. Curt         | Maples        | 39 | Winchester           | CA     | USA         | Veteran |
| 25 | M | Daniel J.       | Martin        | 55 | Boulder Creek        | CA     | USA         | Rookie  |
| 43 | M | Manoel de Jesus | Mendes        | 43 | Brasilia             | DF     | Brazil      | Veteran |
| 14 | M | Mark            | Morris        | 45 | Tyler                | TX     | USA         | Rookie  |
| 16 | M | Peter           | Mueller       | 40 | Kloten               | Zurich | Switzerland | Veteran |
| 77 | M | John            | Radich        | 49 | Monrovia             | CA     | USA         | Veteran |
| 38 | M | James           | Smith         | 38 | Grand Rapids         | MI     | USA         | Veteran |
| 99 | M | Howie           | Stern         | 33 | Mammoth Lakes        | CA     | USA         | Rookie  |
| 11 | M | Marshall        | Ulrich        | 52 | Blighton             | CO     | USA         | Veteran |
| 61 | M | Arthur          | Webb          | 61 | Santa Rosa           | CA     | USA         | Veteran |
| 30 | M | Dean            | Karnazes      | 40 | San Francisco        | CA     | USA         | Veteran |



## Entrant List by Bib Number

|    |             |               |
|----|-------------|---------------|
| 1  | Pamela J.   | Reed          |
| 2  | Jay         | Birmingham    |
| 3  | Monica      | Scholz        |
| 4  | Adam        | Bookspan      |
| 5  | Anita Marie | Fromm         |
| 6  | Ruben       | Cantu         |
| 7  | Lisa R.     | Smith-Batchen |
| 8  | Luis James  | Escobar       |
| 9  | Scott       | Weber         |
| 10 | Rudy        | Afanador      |
| 11 | Marshall    | Ulrich        |
| 12 | Charles     | Vincent       |
| 13 | W. Curt     | Maples        |
| 14 | Mark        | Morris        |
| 15 | Mick        | Justin        |
| 16 | Peter       | Mueller       |
| 17 | JodyLynn    | Reicher       |
| 18 | Blade       | Norman        |
| 20 | Scott       | Ludwig        |
| 21 | JÄrgen      | Hofmann       |
| 22 | Christopher | Hendley       |
| 23 | Bob         | Haugh         |
| 24 | Jean Jaques | Merienne      |
| 25 | Daniel J.   | Martin        |
| 26 | Mike        | Karch         |
| 27 | Mary        | Kashurba      |
| 28 | William     | LaDieu        |
| 29 | Janice I.   | Levet         |
| 30 | Dean        | Karnazes      |
| 31 | Mark        | Cockbain      |
| 33 | Greg        | Eason         |
| 34 | Joseph A    | DeSena        |
| 35 | Nathan      | Ochsner       |
| 36 | Gillian     | Robinson      |
| 37 | Christopher | Bergland      |
| 38 | James       | Smith         |
| 39 | Luis        | Guerrero      |
| 40 | Charlie     | Engle         |
| 41 | Don         | Lundell       |

|     |                 |               |
|-----|-----------------|---------------|
| 42  | Michael M.      | Doppelmayr    |
| 43  | Manoel de Jesus | Mendes        |
| 44  | Sergio          | Cordeiro      |
| 45  | Bonnie          | Busch         |
| 46  | Joe             | Prusaitis     |
| 47  | Jay             | Anderson      |
| 48  | Jane            | Ballantyne    |
| 49  | Louise          | Cooper        |
| 50  | Keith Alan      | Peterson      |
| 51  | Dr. Chris       | Rampacek      |
| 52  | Chris           | Frost         |
| 53  | Nancy           | Shura         |
| 54  | Conrad          | Daniel        |
| 56  | Bill            | Lockton       |
| 57  | Roger           | Klein         |
| 58  | Barbara A.      | Elia          |
| 60  | Chet            | Blanton       |
| 61  | Arthur          | Webb          |
| 62  | Dave            | Remington     |
| 63  | Marvin          | Snowbarger    |
| 64  | Norman          | Haines        |
| 65  | Charles F.      | Waskevich, Jr |
| 66  | Eberhard        | Frixe         |
| 67  | Jim             | Bodoh         |
| 68  | Patricia        | Cook          |
| 70  | Ben             | Jones         |
| 71  | Ken             | Eielson       |
| 72  | Dave            | Goodwin       |
| 73  | Dimitri         | Kieffer       |
| 74  | Dan             | Marinsik      |
| 75  | Ian             | Parker        |
| 76  | Patrick         | Cande         |
| 77  | John            | Radich        |
| 78  | Wayne           | Simpson       |
| 79  | Andy            | Velazco       |
| 80  | Jean Pierre     | Vozel         |
| 98  | Tracy           | Bahr          |
| 99  | Howie           | Stern         |
| 100 | Lisa            | Henson        |



PHOTO: ROLO TOMASI

## Entrant Nationality

|                |    |
|----------------|----|
| Austria        | 1  |
| Brazil         | 2  |
| Canada         | 2  |
| France         | 4  |
| Germany        | 2  |
| Luxembourg     | 1  |
| Mexico         | 1  |
| Monaco         | 1  |
| Switzerland    | 1  |
| United Kingdom | 3  |
| United States  | 60 |

## Entrant State (USA)

|    |    |    |   |    |   |
|----|----|----|---|----|---|
| AK | 1  | ID | 1 | NM | 1 |
| AZ | 1  | KY | 1 | NV | 1 |
| CA | 25 | MI | 1 | NY | 3 |
| CO | 3  | MN | 1 | OR | 2 |
| FL | 2  | MO | 1 | PA | 2 |
| GA | 2  | NC | 1 | TX | 5 |
| HI | 1  | NE | 1 | WA | 1 |
| IA | 1  | NJ | 2 |    |   |



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Throughout August and September theMirrorpool will feature images captured at the 2003 Badwater Ultramarathon.  
Images will be available for download and select prints will be available to purchase.

**theMirrorpool.com**



## **Mission**

It is the mission of the Challenged Athletes Foundation to provide opportunities to people with physical disabilities to pursue an active lifestyle through physical fitness and competitive athletics. The Challenged Athletes Foundation believes that involvement in sports at any level increases self-esteem, encourages independence and enhances quality of life.

## **What do we do?**

Established in 1997, the CAF is a unique organization that recognizes the athletic greatness of people with disabilities and supports these efforts by providing grants for training, competition and equipment needs. Grants are awarded to persons with any type of physical disability and for a wide range of sports. The CAF does not discriminate by age, disability, sport or level of ability. The hundreds of athletes that the CAF has assisted range from world class athletes competing on an international level to those who are recently disabled and desire to become more active. Grants are distributed once a year with applications being accepted year round.



## **Why do Challenged Athletes Need Funding?**

There are 49 million people living in the US with a physical disability. Equipment to be active for someone who is disabled is very expensive and therefore prohibitive for many to pursue an active lifestyle. Funding through the CAF helps make it possible for more people to gain self-esteem through sports. If you're a family with three children, one with a physical disability, you can buy two bikes at Wal-Mart for less than \$200 - for the third, you must purchase a handcycle that runs upwards of \$1,500.

## **Fundraising**

The ten-year goal of the CAF is to create a \$1,000,000 endowment fund that will continue to assist physically challenged athletes indefinitely. Of the revenue generated, 80% will be set aside for the endowment fund or be used for individual grant payments. To date, the CAF has provided over 1000 grants and raised over 3.6 million dollars.

**Challenged Athletes Foundation - 858-793-9293**  
**[www.challengedathletes.org](http://www.challengedathletes.org)**





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