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Sports Product Design
June 8, 2020

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University of Oregon in Portland

Title:

Female-Specific Fit and Functional Design for the Grand Canyon National Park Service
Search and Rescue Ranger Uniforms

Jennifer Null
Capstone Thesis Project Topic Paper
SPD 688
Due June 8, 2020

PART 1

Introduction

“I’m now officially a park ranger. Uniform arrived yesterday in all its oddly-proportioned glory. Apparently female park rangers are expected to have ginormous butts and three-inch waists, according to the size of the trousers I received, but it’ll have to work for the summer. Go ahead, have your laughs.”
– Andrea Willingham Blog entry, June 20, 2013¹

Women have been unofficial employees of the National Park Service from its foundation in 1916. Two short years later, in 1918, the first female ranger was hired. Outfitting the female rangers, however, has been a rough and often times controversial path. Early on, the women in the service would wear a make shift uniform, often times utilizing their husbands’ hunting clothing or the men’s uniform. Today, women’s cut clothing is provided but is very similar the men’s uniform and inadequately addresses the unique body shape of the women rangers.

This thesis project will focus on the history and redesigning of National Park Service uniforms (apparel), specifically law enforcement, female uniforms. Questions to be answered during the course of this project and paper:

1. What is the history of the current NPS female uniforms? How did the uniforms evolve?
2. What about the current uniforms is working? What is essential or necessary?
3. What about the current uniforms is not working, needs improvement or is debilitating to the female rangers when performing their job duties?
4. How can the uniforms be improved? What is the final design path going forward?

Historical Research

History of the Female Park Ranger

Prior to 1918, women who were married to National Park Service personnel had assisted their husbands for years as unpaid help (like the military, it came with the territory).²

1918 – The first female ranger is hired. The first female “Rangerettes” were hired as temporary employees to fill vacancies left by men when they went to war in Europe.²

1960 – the National Park Service issues a written statement on employment of women in uniformed positions that states in part “women cannot be employed in certain jobs, such as Park Ranger or Seasonal Park Ranger ... in which the employee is subject to be called to fight fires, take part in rescue operations not do other strenuous or hazardous work.” It goes on to say that women may participate in “lecture programs, guided tours, museum and library work and in research programs” calling that work “entirely appropriate and very helpful in many Parks.”³

History of the Female Park Ranger Uniform

1918 – the first female ranger is hired. Early “Rangerettes” appeared to wear what was referred to at that time as “camping clothes”. There were no pieces of regulation uniform evident, except for a badge and sometimes a hat.²

Initially, the National Park Service had not provisions, uniform or otherwise, for women. Consequently, there were left to their own devices as to what they wore. Some wore a full men’s uniform tailored for women, and others attached their badges to formal hunting coats, sweaters and other articles of clothing of their choosing.²



(1)



(2)



(3)

Image 1: Early “Rangerette”. Clare Marie Hodges, 1918, temporary ranger for Yosemite National Park.²

Image 2: Frances Pound, 1925, Yellowstone National Park. Here is another case where, due to the lack of uniform regulations covering women, the ranger was left to her own devices. Her knee length coat with slash pockets is undoubtedly of the standard forest green material. For decoration, she has a badge, sleeve brassard, and a pair of collar ornaments at the points of her lapels.⁴

Image 3: Enid Reeves Michael, temporary ranger-naturalist, Yosemite National Park. Michael was hired by Superintendent Washington Bartlett Lewis as a seasonal in 1921, and served in this capacity for over twenty years. She never wore a uniform.⁴



(1)



(2)



(3)

Image 1 (left): Herma Albertson, 1929, ranger-naturalist, Yellowstone National Park. She was one of the first women to wear the complete male uniform.²

Image 2 (middle): Mr. & Mrs. Charles McNalley - Rangers at Tuolumne Meadows, YNP, 1926. These two were a husband and wife team of temporary rangers at the Tuolumne Meadows checking station, Yosemite National Park. Eva is wearing a military web belt with a holster for an Army 45 cal. automatic pistol, although the butt protruding from it appears to be a revolver. Her only signs of authority are her badge and the sidearm on her hip. She's probably only wearing the weapon for the photograph.⁴

Image 3 (right): Martha Bingaman, 1926, seasonal ranger, Yosemite National Park. She assisted her ranger husband, John W. Bingaman, who was assigned at the time to the Alder Creek Entrance Station. Unlike men, temporary women rangers were not required to wear a uniform.⁴

1927 – Two recommended regulations changes submitted by the uniform committee would have affected women had they been implemented. One recommendation called for them to wear the regulation uniforms at the discretion of the director or park superintendent. The second, which would likely have not been received well, called for the female employees not required to wear a uniform to wear a collar ornament “conspicuously on the front waist of the dress”.²

The majority of the photographs of women in the National Park Service at this time are of those employed at Carlsbad Caverns. They showed that when hats were worn, they ranged from chic little light-colored items perched on the side of the lady's heads to standard military overseas patterns of forest green wool.²



(1&2)



(3)



Image 1 & 2: Pauline Mead, temporary ranger-naturalist, Grand Canyon National Park, 1929-1931. The first year (1929, at left), Mead wore civilian clothes with, maybe a USNPS collar ornament for decoration. In 1930 (at right), however, she obtained a uniform on the man's pattern, but instead of the Stetson, the superintendent preferred she wear a soft brim hat, such as that worn by the Fred Harvey Girl Guides of the Southwest.⁴

Image 3: Margaret Fuller Boos, c. 1929, temporary ranger-naturalist, Rocky Mountain National Park. Boos worked two seasons at the park, 1928-1929. She wore the same uniform as the men in the park, except cut for a woman.⁴



(1)



(2)



(3)

Image 1 (left): c. 1930s. These two women are wearing the standard coat, one cut on the woman's pattern, the other on the man's. Both are wearing white stockings. The woman on the left is wearing a

patch of some kind on her right sleeve, but it doesn't appear to be a ranger brassard. Shoes are heavy duty serviceable type.⁴

Image 2 (middle): Lila Michelsen, guide at Carlsbad Caverns National Park, 1931. Michaelson is wearing a standard (men's) coat with a skirt. Badge is probably PARK RANGER.⁴

Image 3 (right): 1937. This woman ranger is wearing a man's style coat with a chic little hat perched on her head.⁴





(6)

Image 4: Guides at Carlsbad Caverns National Park, 1932. These women were classified as guides, although one (second from left) is wearing a ranger brassard. Most images of women in Park Service uniform from this period were taken at this site, due to the number employed there.⁴

Image 5: Ranger Naturalists and Naturalist Staff, 6/13/33, Yellowstone National Park. Herma Albertson Baggley is shown with the rest of the naturalist staff at Yellowstone during her last year with the Service.⁴

Image 6: 1939. Overseas caps apparently were in vogue prior to WW II. Three women are shown here wearing WW I versions in 1939, while Appell appears to have on a beret.⁴

1940 – In the spring of 1940 the Fechheimer Brothers Company forwarded drawings for a distinctive uniform for Park Service women to the NPS uniform committee. It is not known whether these were solicited designs. The drawings have never been located so there is no way to know what the uniform design was but from the correspondence recorded at the time, the uniform sounded very much like that adopted in 1947.

The women's uniform was a very controversial subject, with everyone having their own ideas as to what form it should take. Some didn't like the shirt (the style worn by men) and thought that a sports blouse should be substituted instead. Others believed that the hat should be omitted, or at least changed.²



(1)



(2)



(3)

Image 1: Due to the lack of official guidance, early Park Service women wore whatever the park superintendent or their own whim dictated. Badges were pinned on all types of clothing to identify their association with the Park Service.⁴

Image 2: Aztec Ruins National Monument, New Mexico, June 13, 1940.⁴

Image 3: Jean W. Pinkley, c. 1940s. Pinkley, the daughter-in-law of "Boss" Pinkley, became a noted National Park Service interpreter and archeologist. She is shown here as part of the uniformed staff at Mesa Verde National Park.⁴

1941 - The December 7, 1941, Japanese attack on Pearl Harbor and the resulting General Conservation Order M-73-a, which reserved wool cloth for military uniforms, temporarily halted all further speculation in National Park Service uniforms.²

National Park Service wives were once again enlisted to step in while their husband went to war. They were enlisted to help in particular in offices and entrance station. At that time, even the office staff wore uniforms. While not specific in the uniform regulations, in 1943 a material-saving uniform was created for women.²

Both men and women were instructed to wear the men's style coat throughout the war as long as it was presentable.²

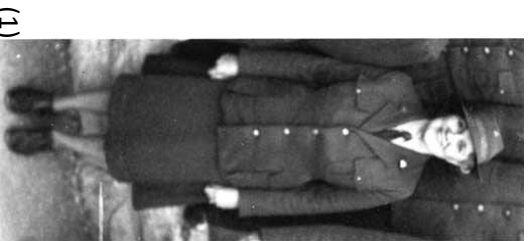


Image 1: 1941. This photograph of Lila (Michaelson) Hansen, shows her wearing what may be the hat prescribed in the 1947 Uniform Regulations. "Soft felt hat with small snap brim, turned up at back and sides and down over the forehead in front, in matching color with narrow grosgrain ribbon on dark green color." But, since it's the only known image of anyone wearing this particular hat, we can't be sure. This shows the USNPS starting to be worn by women on their hats.⁴

Image 2: Scotts Bluff National Monument Personnel, c. 1944. Office personnel were required to wear uniforms at this time and although Meinser is classified as a "Junior Clerk Stenographer," she is wearing a badge, something that was supposed to have ceased per order of the Director in 1920. Note also, the USNPS pin on the front of her overseas cap.⁴

Image 3: Women's dress, 1930s & 1940s Women's uniforms began to become standardized when Carlstad Covers National Park and its uniformed women guides came into the fold, but the first official regulations pertaining to women were not issued until 1947.⁴

1947 – The first official women's uniform was authorized, 31 years after the founding of the National Park Service. It was classified under the heading of "Special Uniforms"³

The uniforms were defined as follows:⁴

The standard uniform for all Service areas in which women are required to wear a uniform in the performance of their official duties while engaged in public contact, interpretive, or protective work, shall consist of the following:

- Coat: The standard men's fatigue jacket.
- Skirt: Six-gore skirt of same material as jacket.
- Hat: Soft felt hat with small snap brim, turned up at back and sides and down over forehead in front, in matching color with narrow grosgrain ribbon on dark green color.
- Shirt: Convertible or standard Peter Pan collar type of steel-gray color. Long sleeves but toned at the wrist. Shirts may be worn open at the neck when so authorized by the superintendent. Such authorization, when granted, shall apply to all uniformed personnel within an area.
- Necktie: Draped bow of soft scarf material, or four-in-hand tie. Dark green in color. (During the summer season, the necktie may or may not be worn, subject to the conditions prescribed in the preceding paragraph.)
- Shoes: Oxford type, dark brown color, plain toe.
- Stockings: Neutral color.
- Belt: Not mandatory. (The standard National Park Service hat band may be adapted for this purpose, if desired, by the provision of buckles instead of the standard thong for lacing.)
- Buttons: Regulation National Park Service buttons are prescribed.
- Insignia: Same as for men employees
- Materials: Same as for men employees."



Image 1: Uniform for Women Employees, 1947 Uniform Regulations - Amendment No. 5, May 1950. This image of Olive Johnson wearing a modified style WAAC Army uniform was used to illustrate the women's uniform in the Amended 1947 NPS Uniform Regulations. Even though the "overseas" cap was not addressed in the regulations, it was being worn by the women and thus, included in this picture.⁴

Image 2: The Mission Church from the southwest, Tumacacori, NM, 1947 (detail). Sally Brewer (Harris) is shown standing at the church entrance in a plain skirt. Coats could be left off in hot climates at the discretion of the superintendent.⁴



Image 1: Viola V. Shannon, park guide, Carlsbad Caverns National Park, 1951. This portrait shows the recessed pockets of the uniform, as well as the USNPS pin on the "overseas" cap.⁴

Image 2: Olive Johnson, Doll's Theatre Big Room, Carlsbad Caverns National Park, 4/1953. This early color photograph shows that Johnson's hat and coat are 2 different colors. The coat appears to be "Army" green and her cap forest green. The Arrowhead patch had just begun to be issued the previous Fall.⁴

1956 – New uniform regulations were drawn up and those pertaining to the women's uniforms remained the same, even to the wearing of the men's fatigue jacket (now called the standard men's field jacket.)²



Image 1: Seasonal Ranger-Historians, 1957 Season, Roosevelt-Vanderbilt National Historic Site, Hyde Park, New York. Though all three are Seasonal Ranger Historians, only the men are wearing badges.⁴

1959 – The 1959 Uniform Regulations authorized the first “stewardess” pattern, which became effective on January 1, 1961. These new regulations only provided for dress uniforms for women. (B&B full) The jacket and skirt were styled after Delta Airlines uniforms. The pillbox hat is modeled after those worn by the American Airlines stewardesses.³

“Dirty work” clothing was to be civilian “garb” without any identifiable National Park Service garments or insignia. The uniform was to be worn only by women employees whose duties involved primarily contact with the public. Occasional contact or brief relief assignments in which contact with the public occurred did not qualify them to wear a uniform.⁴

The 1961 uniform regulations were as follows:⁴

- The hat was to be designed after those worn by American Airline Stewardesses (Delta Uniforms #A-707) at that time. USNPS was to be embroidered in gold on the front in 1/2-inch letters. However, this was changed to silver on March 21, 1960, prior to the regulations taking effect, when it was noted that gold was not consistent with the other ornamentation on the uniform. (silver USNPS and badge).
- The jacket was also styled after that of the airline stewardess. It was a four-button model (Delta #A-703), tailored to fit, with the small arrowhead patch on the left shoulder.
- The skirt was to be straight with front and rear 10" kick pleats proportioned to size. (Delta #A-703) It was to be worn without belt.
- The blouse could be made out of any suitable white fabric. It was to be short sleeved, open necked, (a tie was no longer part of the women's uniform) and plain design without pleats or ornamentation. Patch was to be worn on left sleeve, same as jacket.
- Shoes were changed to grace the new uniform. They were no longer just oxfords, but now any women's shoes with either low, Cuban or French (high) heels could be worn. They were to be of a plain cordovan colored closed toe and heel design, without slashing or other conspicuous ornamentation. (brilliant, large bows, ribbons, etc.)
- Stockings remained a neutral shade (silk, nylon, or similar fiber) and overshoes could be either zippered galoshes, like the men, or black rubberized calf-length pull-on boots.
- Jewelry, except for rings and wristwatches, was not to be worn.
- Stormcoats and raincoats were to be the same as the men's.

After the distribution of the 1961 uniform regulations, complaints and suggestions began to come in from the field. One specific item dealt with the location of the badge and nametag. There were no breast pockets on the women's jacket so the badges sat too low for a good appearance. Some women expressed strong opinions against wearing the badge, while others were just as adamant for it.

This was later resolved by issuing the women a silver arrowhead pin, the same size as the tie tack, “in lieu of a badge” though superintendents had the option of issuing them a regular badge if they desired.⁴

Some experiences with the small pin were negative.

“Mary Bradford relates that when she received her pin, she was very unhappy about it. Visitors did not consider her having any authority and would by-pass her to talk to the "ranger with the badge". So, she refused to wear it and requested a badge from her supervisor. He agreed with her and issued her a regular ranger badge. Unfortunately, when she pinned it on her uniform it proved to be too heavy for the material. But, exercising that 'old ranger know-how', She stuck the pin through her jacket and fastened it to her bra strap.”²

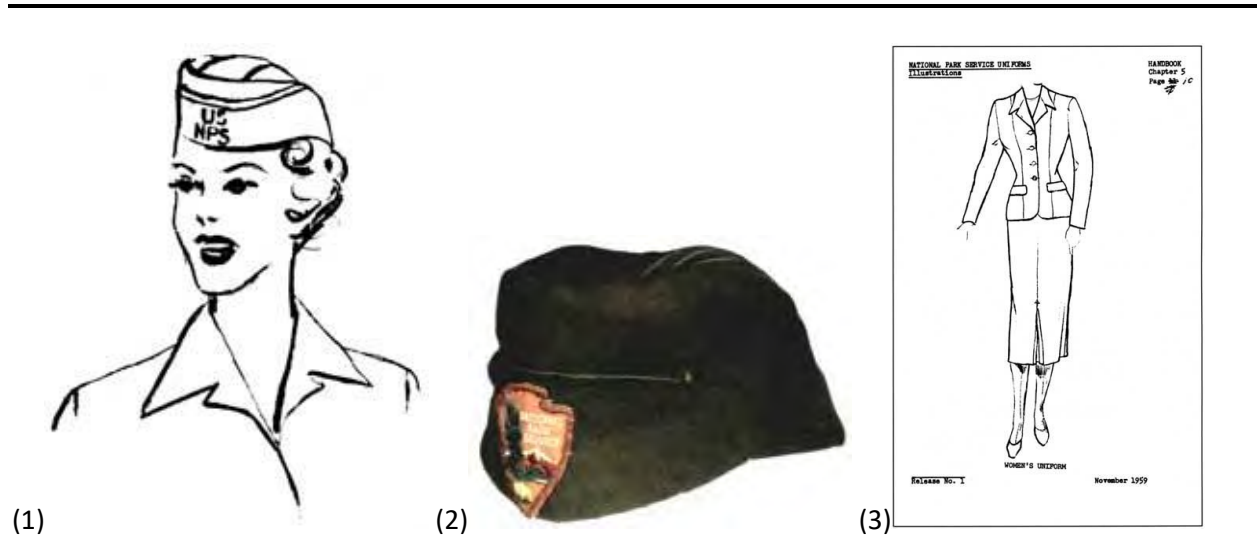


Image 1: Illustration in the 1961 National Park Service Uniform Handbook depicting the new 'Airline Stewardess' style uniform hat.⁴

Image 2: The 1961 pattern women's hat. This hat had a more pleasing appearance on paper than in person. It was changed to the more familiar "Buffalo Chip" design prior to the introduction of the 1962 pattern uniform. This hat has the small arrowhead crudely whip-stitched on the front indicating it was worn after the uniform change in 1962.⁴

Image 3: Illustration in the 1961 National Park Service Uniform Handbook depicting the new "Airline Stewardess" style uniform.⁴



Image 1: Women's uniforms in the 1960s. The 1961 pattern uniform was authorized in the 1959 Uniform Regulations, but was not to become effective until January 1, 1961, but more than likely, anyone purchasing a uniform in 1960 ordered the new pattern. For some unexplained reason, the uniform was changed again in 1962. The material and color remained the same so the effect was minimal.⁴

Image 2: Mary B. Weatherwax, Roosevelt Vanderbilt, 1961. As this photograph testifies, not all women ran out and purchased the new uniform as soon as it came out. Even so, they were supposed to have switched over by January 1, 1961.⁴

1962 – Although the uniforms retained the “Stewardess look”, the collar on the shirt and jacket changed to a shawl collar and the number of buttons on the coat jackets reduced from four to three. Only women whose duties involved regular public contact wore the uniform.³

These uniforms were described as “early orthopedic” and “old maid dowdy” by those personnel in the field wearing them. It was not only unattractive but often a source of professional frustration” to the women wearing it.⁴

The uniform proved totally inadequate for the varied functions and duties of the women in the National Park Service.

Even though mini-skirts were in vogue, the hem of the dress and skirt were not to exceed 2 inches above the knee. It can be assumed that the uniform committee’s intention was to have everyone in the National Park Service dressed in the standard forest green. Even the swimsuits and the terrycloth beach robes were specified to be this color.²



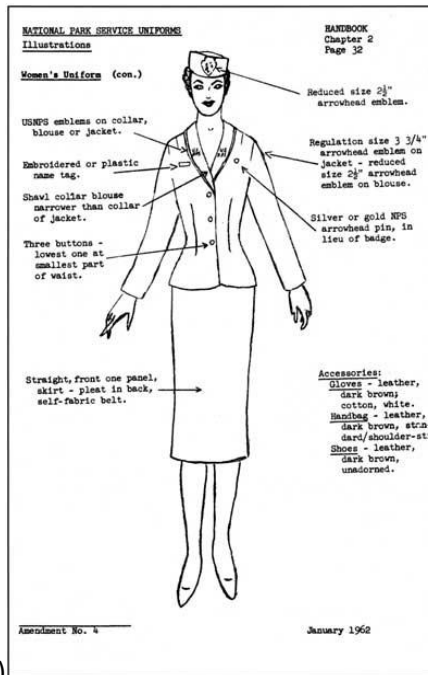
(1)



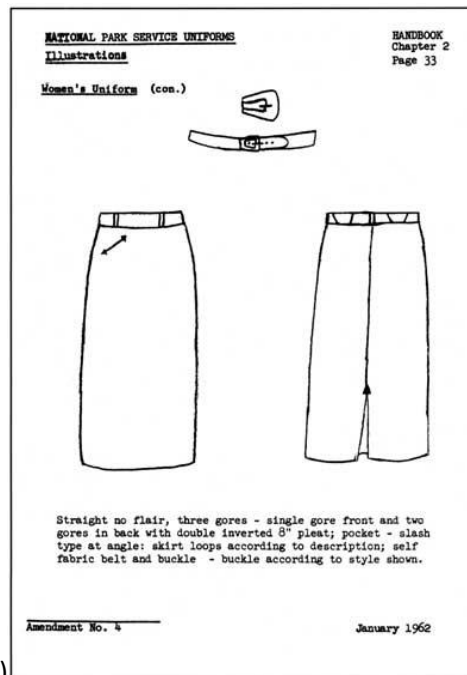
(2)

Image 1: Mrs. Mitsuko T. Shikuma, 1962. Shikuma was an Information-Receptionist, at Park Headquarters and Visitor Center, Hawaii National Park, Hilo, Hawaii. While not substantial enough for field duty, the 1961 uniform was well suited for this type of activity.⁴

Image 2: Beatrice Lunt, Colonial National Historical Park. Lunt is wearing the Model 1962 stewardess uniform with the plastic nametag and Arrowhead pin ("in lieu of badge"). The "regs" called for the USNPS to be worn on the blouse collar, if worn outside, but she has hers on her coat lapels.⁴



(1)



(2)

Image 1: Illustration from the 1962 National Park Service Uniform Handbook showing the second "Airline Stewardess" uniform.⁴

Image 2: Illustration from the 1962 National Park Service Uniform Handbook showing skirt used with the 1962 Women's uniform.⁴

The blouse on the 1962 updated uniform was to be made out of any suitable plain white material without any decoration. The blouse could be long or short sleeved. The collar was to be the same size as on the jacket and could be worn either under or over the jacket collar. The reduced sized arrowhead and nametag were to be worn on the blouse like the jacket.

Because of lack of prescribed fatigue, work or casual clothing for use by women, it was necessary for them to select "proper and conservative" attire for duty other than that requiring wearing of the uniform.⁴



Image 1: Louise Linen, Great Smoky Mountains National Park. This image shows clearly the ornamentation to be worn on the blouse. Her badge appears to be lying flat on her blouse. Maybe she is also utilizing Mary Bradford's method of securing it.⁴

Image 2: Janet K. Seapker - NCFA/WHHO, 1967. This excellent view of the 1962 uniform shows that the cap did not always "mess-up" the women's hairdos. Seapker is wearing the "National Park Service" (Model 1960C-All uniformed personnel, except superintendents and rangers) badge.⁴

Image 3: E. Elaine (Russell) Clark, Park Guide, Andrew Johnson National Monument, 1963. Clark updated her 1961 pattern hat by applying a small arrowhead patch, but she is apparently wearing the 1962 pattern skirt.⁴

Image 4: Marie K. Absalon is wearing the 1961 pattern uniform with the 1962 hat. Most women, who had purchased the new uniform in 1960, when first authorized, continued to wear them, as long as they were serviceable, even after the 1962 pattern came out. The two uniforms were compatible since both were made from the same material. Only the cap insignia needed to be changed.⁴

Image 5: House where Lincoln died, 1967. This is part of Ford's Theater National Historic Site. Miss Rolle is shown wearing a 1962 pattern uniform. These uniforms were ideally suited for urban sites such as this.⁴

Image 6: 1962 pattern (stewardess style) woman's uniform. Also shown is a variant style hat with pin stripes made by Mae Hanauer of New York.⁴

1970 - Pants are introduced in the women's uniform. Although many women did not like the 1970 uniform for its impractical color and fabric, they did appreciate that it included a pantsuit option.³

Original plans for the new 1971 uniform regulations were to be as follows:⁴

- Dress-synthetic combination wool-jersey knit "yoke shift", standup collar with the arrowhead shoulder patch.
- Jacket -blazer type of synthetic combination wool-jersey knit, without collar, double breasted with gold colored NPS buttons, arrowhead shoulder patch.
- Vest -V-neck type synthetic combination wool jersey knit with gold colored NPS buttons down the front and on pocket worn with nameplate.
- Blouse -white Bermuda or Peter Pan type collar, roll up sleeves for wear without blazer or vest or short sleeve for wear with blazer. Dacron-polyester cotton blend.
- Scarf -silk or nylon with small arrowhead insignia interweave or matched motif, in various sizes for wear as muffler, scarf, in hair or as handkerchief.
- Skirt -A-line with 1 inch or small waistband combination synthetic (wool material); jacket, vest and skirt can all be of combination wool jersey or cotton just so pieces match in material weight and color—one is washable, other must be dry cleaned.
- Hat -pillbox, made of material to match jacket vest, skirt and dress; similar to United Airlines Stewardess style 1969.
- Straw -rough-braid with small brim, gross-grained and stitched cordovan colored plastic band insert.

- All-weather coat - (hat to match) Balmacca features Ze Pel treated for water with or without zipper acrylic pile liner.
- Sweater - standard green-colored, long sleeved cardigan style wool or nylon.
- Gloves - white if cloth, cordovan if leather or plastic.
- Purse (or handbag) - white if cloth, cordovan if leather or plastic.

These regulations never did take effect. There are no articles of clothing that correspond to the sketches in either photographs or artifacts.

Requesting input from the field in regards to the uniform changes was implemented. There was a "think tank" conducted at National Capital Parks in Washington, D.C. Here women of all sizes and background gathered for a four-hour discussion of the uniform problems of the service.

Female Rangers weighed in on the new uniform regulations:⁴

- "The fitted jacket isn't functional or comfortable. It should move easily but look smart, particularly in the city."
- "We participate in many ceremonial functions here with the military. They always wear their dress uniforms and we look pretty drab in comparison."
- "We climb hills and mountains and rocks. It's rugged. We tried bermuda shorts with knee socks, but they didn't protect us from poison ivy, stinging nettles or brambles in meadows. We need something more functional. Loose slacks are fine and Levis are great."

The feeling was pretty unanimous in the dislike of the present hat. All thought it was "unattractive, dated, and a threat to their hairdos."

1970 – New designs sketches, fabric colors, along with swatches were presented and endorsed by the uniform committee.





(4)



(5)



(6)

Image 1: The initial concept for the new uniforms, as it appeared in the NPS Newsletter. These designs, with slight alterations, became the foundation for the new women's uniforms.⁴

Image 2: Carole Scanlon and Betty Gentry display the new uniform in contrast with the old at the Director's private "fashion show" in Washington, DC, March 20, 1970.⁴

Image 3: Director Hartzog was so impressed by the new fashions, he gave it his immediate approval.⁴

Image 4: Director Hartzog clowning around with new women's uniforms at Grand Unveiling at Independence National Historical Park, June 27, 1970.⁴

Image 5: Irene Beckman makes last minute adjustments to the Chairwoman's smock.⁴

Image 6: Carole Scanlon models the many combinations of the new uniform.⁴

Joan Glynn is quoted in an article for the National Park Service Newsletter about the inspiration for the proposed uniforms.

“In choosing the color identification, for example, she went to the roots of our natural heritage—to the colors of earth, sand and sun. The ingredients are a warm deep beige (the predominate color of most of the outfits); a clear, fresh white (used mostly for trim); and a sunny, golden orange (an accent color). Already existing in our identification symbols, these colors can serve to help unify the many elements in the natural, historical and recreational groupings within the Park Service.

To maintain this unity of design, simple, clean lines were used—and are echoed in each of the items for easy coordination. Thus, the jacket and hat may be worn not only with the dress, but also with the matching culottes and slacks. The beige coat has a zip-out lining in bright orange, which will accent the colors of the scarf.

The outfit for supportive personnel is in the same beige color and in a similar design, but loose enough to fit several sizes. Park wives will have their own special short popover in sun-orange to wear over regular clothes while performing special duties or acting as hostesses. Chairwomen will don a comfortable cover-up in orange and white or beige and white crinkle cotton.”⁴





(3)



(4)



(5)



(6)

Image 1: Park Service wives and employees model the new women's uniforms.⁴

Image 2: Mary Rinehart and Carole Scanlon display the "Old" versus the "New" Park Service look.⁴

Image 3: This informal view shows the back of most of the uniforms, especially that of Helen Hartzog's "Park wives Pop-on".⁴

Image 4: The wind assists Marion Riggs in displaying the styling of the culottes.⁴

Image 5: Many "art-sy" photographs, such as this one of Carole Scanlong, were taken to show off the new uniforms.⁴

Image 6: Director Hartzog shows off the new women's scarf.⁴

It didn't take the women of the Park Service long to realize that the new uniforms were more fluff than substance. If anything, they added to the problems of the women, not being as serviceable as those previously worn. The new uniforms were very stylish and chic, for duty in the offices and visitor centers, but in the field they were useless.

The public did not always realize that the women wearing these new uniforms were even in the Park Service. They still envisioned the ranger wearing forest green.²

“Not only were these new uniforms not suited for the field, under the right circumstances, they could be downright hazardous. Mary Bradford relates the story of being called out in an emergency, to help fight a brush fire. After the fire was out, she discovered that the heat had melted the hem on her dress.”²

The badge continued to be a problem for the women. Once again, the fabric would not support the badge and this time the solution was to issue a smaller, light weight version of the badge. This solved the weight problem only to have it cause the women rangers to lose their credibility. The public thought the new badges were “cute” and often asked if they could be purchased as souvenirs for children. These badges were quickly recalled.



Image 1: The 1970 uniform regulations pertaining to women brought forth a plethora of uniforms. Not only did the female rangers now have their own distinctive dress for formal occasions, but for the first time there was a whole range of other clothing for their different functions.⁴

1972 – Centennial year for the National Parks. A new uniform option was authorized for those employees of the Washington and Regional Office, as well as those in-service centers who frequently represented the National Park Service in external affairs, events and meetings. It was also used by park employees in interpretation, administrative or other positions which involved frequent contact with the public.⁴



Image 1 - Optional woman's Centennial dress, 1972. Although not covered in the official correspondence, this uniform was instituted on March 20, 1972, for the Centennial of the Nation's parks. It served as a companion piece for the men's optional urban dress. There are several photographs showing women wearing this dress. It appears to match the scarf which would make it off-white with orange polka-dots.⁴

Image 2 - Publicity photograph showing new "Urban" men's uniform as well as the women's 1970 uniform dress and new "Centennial" dress, 1972.⁴

1974 – A new uniform is introduced. The uniform was still be the "A line" style of double-knit polyester, although now it was to be dark green. Some women quickly christened it the "McDonald's" uniform because it reminded them of those worn by fast food workers.

A second uniform classified as the "basic pant-suit" was authorized. It consisted of the same article of clothing as the first except the tunic and pants replaced the dress. Also, a scarf was optional.

In order to placate some of the dissatisfied women in the field, a third optional uniform was added. It was classified as the "women's traditional uniform" and was essentially the standard men's uniforms with a couple of exceptions.²



(1)

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(3)



(4)



(5)

Image 1: Marsha Wood, 1975. Wood is modeling the new Class B (pants suit) uniform.⁴

Image 2: 1974 women's Class 'A' uniform, with and without jacket.⁴

Image 3: The 1974 uniform regulations brought forth the fourth uniform change for women in fourteen years, negating their clothing allowance "catch-up" factor. However, along with the "McDonalds" uniform was one that harbingered things to come. One based on the men's style of uniform.⁴

Image 4: Showing off the new polyester uniforms, 1975.⁴

Image 5: Linda Balatti, 1975. Balatti is wearing the 1974 pattern Class A uniform with cardigan jacket.⁴

1978 – Uniform regulation authorized women to wear the same “gray and green” – in all of its configurations – as their male counterparts. Supply shortages and other issues delayed the implementation of the new women’s uniform standard.³

The only differences in the regulations were that the women were to wear a cross tie instead of the four-in-hand and they had the option of wearing a skirt. Along with this, there were authorized to wear the complete assortment of special duty clothing.

1979 – Lack of progress address the uniform issues leads to a class actions lawsuit files against the National Park Service. The law suit was withdrawn a few months later when differences were resolved.³

One of the things the women requested was a regulation maternity uniform. In the past, when these were ordered, they usually received a makeshift arrangement such as an extra-large man's shirt and a pair of trousers with a stretch panel replacing the fly. Now they had maternity apparel that identified them as a ranger.⁴



Image 1: The 1980s brought the women into the mainstream of the National Park Service by furnishing them all the various uniforms needed to accomplish their mission. Plus, a couple of extras not authorized for men. Notably, skirts and maternity clothing.⁴

Image 2: Marjoie M. "Mike" Hackett, superintendent, Fort Point National Historic Site, 1976. Hackett is wearing what some people consider the most attractive uniform designed for women in the Park Service, the "Woman's Traditional Uniform" authorized in 1974. She also has on the short jacket, sans pockets which appears to have been the standard coat for women. This jacket is often called the "Ike Jacket", attributed to General, later President Eisenhower, but that jacket has large breast pockets and didn't come into being until later. She is also wearing the black turtleneck in lieu of a tie.⁴

Image 3: The young ranger shown here at Padre Island National Seashore in 1978, is assuring this little endangered Ridley turtle hatchling a safe passage, at least on the first leg of its long journey. Along with her shorts and cap, she is wearing all the insignia identifying her Park Service affiliation.⁴

1980 – R&R Uniforms was awarded the contract to furnish both women's and men's uniforms.³ Up until now, the National Park Service had dealt with two uniform suppliers.

The first item of business was to reconcile the size and cut of the various articles of clothing to fit the women. This didn't create a problem until it came to the dress coat. It wasn't thought that the large pleated pockets presented an appropriate appearance, especially on the more endowed women. Consequently, the coat was eliminated from the 1981 catalog while the company strived to create a style of coat that would look good on both sexes, while carrying on the traditional image. This was resolved by removing both upper and lower patch pockets from the coat and substituting fake pockets consisting of only a pocket flap and button. The coat became available again the following year. This is the coat used today.⁴



Images 1 – 7: As this sampling of uniforms from a R & R Uniform catalog of the 1980s shows, women could now fill their closet with uniforms to cover all occasions, just like the men. (1) Coat and trousers Class "A" dress uniform (2) Parka for Class "A" uniform (3) Cardigan sweater (4) Reversible raincoat (Forest Green on one side, International Orange on reverse) (5) Maternity top and slacks (6) Long sleeved shirt with skirt (7) Twill work jacket and cap⁴

The Go-Go Boots

The so called “go-go boots” as part of the 1970-1974 beige uniforms are a controversial aspect of the NPS women’s uniform. At the time, uniform suppliers did not provide women with a standard shoe or boot so there are no catalogs that shoe go-go boots or (or any other kind) to order. Women supplies their own shoes based on general requirements.

The 1970 Uniform Standard states that the boots “should be simple in styling, comfortable and for the winter they should have warm lining. Again, color should be beige or tan to light brown in the same color family as the basic uniform in a smooth or lightly grained leather (not suede or reptile). Work boots should coordinate as nearly as possible.”

One of the photographs usually cited as evidence of the white go-go boots is used on the cover of the NPS Uniform Series, Volume 4, which shows Marios Riggs Durham modeling a new uniform. Marion herself states that she “detested everyone calling them go-go boots” and although the boots look whited on the printed cover, the original photograph and others taken that day clearly show they were tan.

Other photographs of the NPS history Collection of women wearing the 1970 uniform show them wearing low-heeled tan or brown shoes.³



(1)

Image 1: Marios Riggs Durham modeling a new uniform.

The National Park Service

The National Park Service is an agency of the federal government within the executive branch of the government under the Department of the Interior. The director who works out of the main Interior Building in Washington, D.C., is charged with overall administration and management of the almost 400 units of the National Park Service stretching from Guam in the Pacific to the American Virgin Islands. All of these parks are divided into seven areas overseen by the regional offices. The individual park units fall under each regional director.⁵

A national park unit is managed by a superintendent, who has overall responsibility for all operations of the unit under their supervision. These units range from National Parks to historic sites, seashores, monuments and parkways. The size, complexity and level of staffing within the park unit determine its organization and distribution of jobs.⁵

There are currently 61 of National Parks in the United States. Each park has its own challenges with maintaining safety. The weather, length of harsh cold and hot seasons, size and layout of the park boundaries, remoteness of backcountry, number of visitors, wildlife and vegetation are examples of these challenges.

Grand Canyon National Park

The National Parks are all vastly different in many aspects with geological environment, climate, employment numbers and coverage and being a few of the factors that will influence my designs. In order to control the research and limit the amount of information, my research will be focused on the female NPS Rangers (law enforcement) working at the Grand Canyon National Park.

General Park Info

The Grand Canyon became a national park on February 26, 1919.⁶

The Grand Canyon was the 2nd most visited park in 2018 with 6,380,495 visitors.⁶

The Grand Canyon is bigger than the state of Rhode Island. It is a mile deep, 277 miles long and 18 miles wide. While the park does not include the entire canyon, it measures 1,904 square miles in total. Rhode Island is around 1,212 square miles.⁷

Staffing⁸

Fiscal Year 2017 Information and distribution of all staff (Permanent, Term, and Seasonal) as of January 2018:

Superintendent's Office: 12
Project Management Team: 2
Administration: 20
Science and Resource Management: 40
Commercial Services: 10
Planning and Compliance: 10
Facility Management: 106
Interpretation: 39
Visitor and Resource Protection: 125
Fire and Aviation Management: 16
Total: 382

2017 Law Enforcement Activities⁸

Law Enforcement Activities:
Part I Offenses Investigated: 46
Part II Offenses Investigated: 928
Law Enforcement Jurisdiction: Concurrent

Emergency Medical Services:
Emergency Medical Service Incidents: 1,135
Fatalities: 20
Search and Rescue Incidents Total: 290

Structural Fire Incidents and Responses:
Total: 68

Wildland Fire Incidents and Treatments:

Fire Starts Incidents: 13

Acres treated with fire: 6,911

Acres of defensible space treated: 422

2017 Interpretive Services and Activities⁸

Visitor Centers and Contact Stations:

Grand Canyon Visitor Center

Verkamp's Visitor Center

Yavapai Observation Station

Tusayan Ruin and Museum

Desert View Visitor Center

North Rim Visitor Center

Kolb Studio

Interpretive Walks, Talks, and Programs:

2,454 presentations to 275,106 visitors

Environmental Education Programs:

546 presentations to 17,019 participants

32,376 Junior Rangers sworn in

Seasons and Average Temperatures⁹

The elevation change and depth of the canyon play a major role in the extreme environmental challenges that Rangers face daily. Visitors frequently underestimate the temperature and difference in temperature from top of the rim to the bottom of the canyon.

Summer

Plan for hot, mostly dry weather in May and September; extremely hot, dry weather in June; and hot with monsoon thunderstorms in July and August.

Average temperatures at the top: 48°F to 83°F (9°C to 28°C) Average temperatures at the river: 74°F to 104°F (23°C to 40°C); temperatures can feel like 140°F (60°C) in the sun and reach 115°F (46°C) in the shade.

Winter

Plan for short days and long, cold nights with potential snow and ice at the top and rain in the canyon. The upper portion of all trails can be icy and dangerous. The South Kaibab Trail receives more sun than the Bright Angel Trail.

Average temperatures at the top: 19°F to 45°F (-7°C to 7°C) Average temperatures at the river: 38°F to 59°F (3°C to 15°C)

Spring and Autumn

Plan for short days with highly variable weather. While the climate is typically cool, it can snow or be intensely hot. High winds are common.

Average temperatures at the top: 32°F to 63°F (0°C to 17°C) Average temperatures at the river: 56°F to 82°F (13°C to 28°C)

Busiest Times

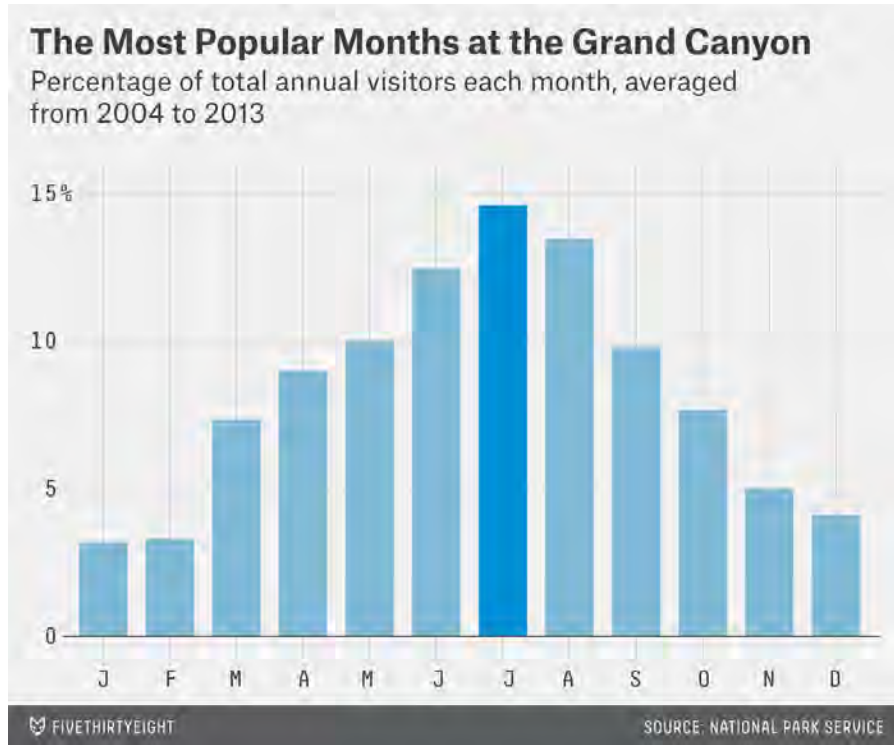


Chart: The Most Popular Months at the Grand Canyon
From 2004 – 2013 the Grand Canyon saw an average of 4.4. million visitors annually.¹⁰

The ideal time to visit the North Rim is between May and October. The summer season is always the busiest for the Grand Canyon, but the majority of the tourists venture towards the South Rim at this time. Also, the North Rim tends to have cooler temperatures than other areas of the Grand Canyon, providing more relief from the summer heat. The North Rim is also closed during the winter months.¹¹

The ideal time to Check Out the South Rim in the Fall. The most popular area of the Grand Canyon is bound to have crowds year-round, but you can avoid the biggest rush if you choose to visit the South Rim during the fall season.¹¹

If you are mostly concerned about weather, the Grand Canyon’s climate has cooler weather and less rainfall between April and June. July and August are the worst months to visit the Grand Canyon due to larger crowds and hotter, wetter weather.¹¹

Safety Warnings

It is important to note the efforts put in place to warn visitors of the dangers of hiking unprepared in the Grand Canyon.



Image 1: Warning Sign 1



Image 2: Warning Sign 2



Image 3: Warning Sign 3

Every year, hundreds of people start their hikes by having their pictures taken with these signs. Mocking the sign is a fool's amusement. Park Rangers find portraits of hiker grinning in front of them when they develop rolls of film removed from the bodies of people who died on the trail.¹²

Injuries

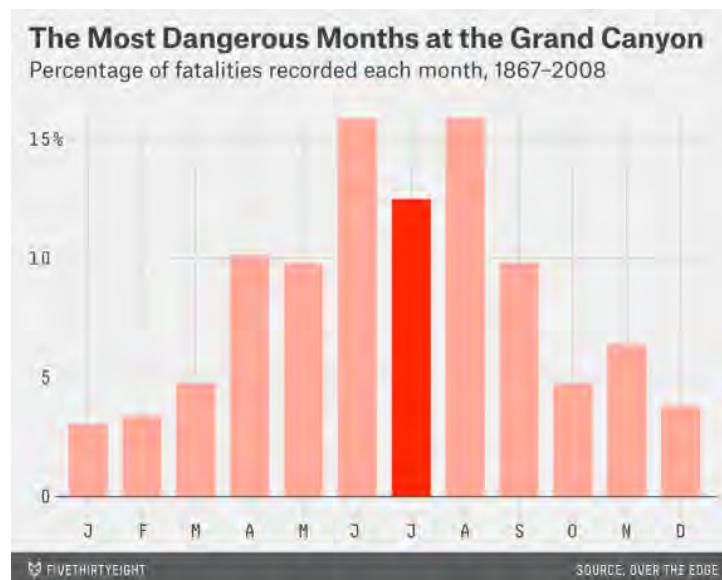


Chart: The Most Dangerous Months at the Grand Canyon¹⁰

When people think about danger in the Grand Canyon, they naturally think of falling. Falls are very rare though. The 108 falls recorded from 1867 to 2008 account for nearly 34% of the Canyon's recorded fatalities. This percentage excludes plane crashes, because the 375 recorded plane crash fatalities were clustered into a few months. Plane crashes were also responsible for the single deadliest day in Canyon's history when two off-course commercial airlines crashed over the Grand Canyon in June 1956. Almost 25% of recorded deaths (excluding plane crashes) have been due to the environment and are mostly heat related.¹⁰

Mottos

National Park Service Mission Statement:

"The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations. The Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world."¹³

Junior Ranger Motto:

"Explore, Learn and Protect!"¹³

Education & Certifications

Non-Law Enforcement

The basic requirement for a (non-law enforcement) park ranger in any discipline is a four-year college degree. There are no specific degree requirements. Several universities do not have programs specifically design to prepare a student to become a park ranger.

Many rangers start out working in temporary seasonal positions while in college. Applicants who have experience working in temporary positions gave a great advantage over other applicants.¹⁴

Law Enforcement

Park ranger positions in protection or law enforcement require a degree from a college, university or academy approved by the National Park Service.

For positions in law enforcement or firefighting you will also be required to take and pass a medical exam and physical fitness test.¹⁴

User Data

Gender

Rangering is still a male-dominated industry. With around 20,000 park rangers in the NPS workforce, less than 40% are female.¹

Age

Depending on the state, an applicant must be at least 18 or 21 years of age. No maximum age. Betty Reid Soskin is an interpretive ranger at the Rosie the Riveter WWII Home Front National Historical Park and is 98.

The minimum age for a law enforcement ranger is 21. The maximum entry age for permanent law enforcement ranger is 37. Retirement is mandatory at 57.¹⁶

Grand Canyon Specific Staffing⁸

Grand Canyon Fiscal Year 2017 Information and distribution of all staff (Permanent, Term, and Seasonal) as of January 2018:

Superintendent's Office: 12
Project Management Team: 2
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Total: 382

Positions & Experience

"A park ranger is a protector. You protect the land from the people, the people from the land, the people from each other, and the people from themselves. (Author Kurt Caswell)¹

The basic national park staff organization is focused on the functions of: protection, interpretation, maintenance, administration and resource management.

In general, there are 3 types of park employees: office personnel, public facing, and law enforcement.

Positions who would wear a uniform: park managers, interpreters, law enforcement rangers, cultural resource managers, natural resource managers, maintenance workers and US Park police officers.³

Uniforms are different styles dependent on their position and duties. Three types of uniforms are 1) service uniform, for public contact positions; 2) field uniform for public contact positions where environmental conditions dictate a more practical uniform and 3) work uniform which would be used for work projects and in the backcountry.³

My research will focus on the Park Rangers that fall under the protection category. This category includes the jobs of law enforcement, fire-fighting, public safety, visitor management, campground management, public health inspections, search and rescue and emergency medical services.⁵

NPS Rangers Injuries and & Death.

Recorded Deaths for DOI Officers Killed in the line of duty:¹⁵

There are more than 3,500 permanent and seasonal law enforcement officers who serve across the Department of the Interior (National Park Service Law Enforcement Rangers are included in this number). To date, 139 Department of the Interior Officers have died in the line of duty since the department's founding in 1849. The number of deaths include those employees who died while engaging in live-saving action, killed feloniously or engaged in direct fire suppression actions.

Hazards on the Job

National Park Rangers are exposed to many hazards on the job. The Rangers in a position of law enforcement are exposed to the same dangers as a police officer. Criminals visit the park to seek refuge or hide from the law along with the families who are there to enjoy the scenery. Rangers may face assault when they attempt to subdue a suspect, as campers to reduce noise levels or investigate a suspicious vehicle.¹⁷




Although it is a special circumstance, National Park Service Rangers are on call to respond to wild fires across the U.S. Although rangers have the equipment and training needed to combat the fires, they can be unpredictable and change in the wind or a miscalculation can create problems escaping the blaze.¹⁷




Search and rescue is an extremely important and dangerous task assigned to the Park Rangers. The parks are so large and the locations of individuals is often remote. The amount of acreage and backcountry varies from park to park but each search and rescue has their own set of hazards. Visitors who need rescuing can just be lost or may have sustained an injury that immobilizes them. Rangers may need to search rugged terrain quickly or run miles to the location of the injured party. These conditions put the rangers at risk for falls, weather related injuries or even a potential encounter with dangerous animals. Even animals who are normally peaceful can pose a threat when they feel threatened or misinterpret the actions of a ranger who is trying to help them.¹⁷




Rangers who work in larger parks with lots of backcountry often have to work in remote areas, and in some cases, they have no cell phone coverage or access to radio communications. This can make it difficult to obtain backup assistance if it is needed. Often times, backup is not immediately available because of the size of the park or that the location is difficult to navigate to. It may take a significant amount of time for help to arrive. The isolation exposes the rangers to additional risks. Should they be injured, such as suffering a debilitating fall, become ill or need to subdue multiple suspects, they may be unable to summon help or the help might be so slow in arriving that their injuries or situation could become even more severe.¹⁷

Physiological & Biomechanical Needs

On a daily basis throughout the over four hundred areas managed by the National Park Service, rangers risk their lives to save others and protect the resources of our parks.⁵ Law enforcement rangers wear many hats and their days look different from one day to the next.

Roles Rangers Fill/Risks Rangers are exposed to¹⁷	Specific Tasks/Actions	Material Needs
<p>Everyday Tasks / General public interactions</p>  	<ul style="list-style-type: none"> - Running, walking - Hiking - Horse riding - Standing for long periods of time - In and out of conditioned/non-conditioned spaces 	<ul style="list-style-type: none"> - Thermal regulation - Moisture wicking - Odor resistant - Stretch - Wrinkle-resistant - Stain-resistant - Durability - Long life cycle (limited uniform allowance each year) - User friendly / easy cleaning requirements
<p>Law Enforcement</p> 	<ul style="list-style-type: none"> - Running, walking - Hiking - Horse riding - Riding in cruiser - Standing for long periods of time - In and out of conditioned/non-conditioned spaces - Self-defense maneuvers - Tackling/wrestling perpetrators - Carrying weapon(s) 	<ul style="list-style-type: none"> - Thermal regulation - Moisture wicking - Odor resistant - Abrasion resistance - Durability - Stretch - Wrinkle-resistant - Stain-resistant - Long life cycle (limited uniform allowance each year) - Repairable (fixes for rips, holes, wear) - User friendly / easy cleaning requirements

<p>EMT</p> 	<ul style="list-style-type: none"> - Walking - Lifting heavy equipment - Lifting stretchers / humans 	<ul style="list-style-type: none"> - Stretch - Long term comfort / next to skin comfort - Thermal regulation - Moisture wicking - Odor resistant - Abrasion resistance - Durability - Stain-resistant - Long life cycle (limited uniform allowance each year) - User friendly / easy cleaning requirements
<p>Search & Rescue</p> 	<ul style="list-style-type: none"> - Long distance walking, hikes, running, uphill climbing - Navigate rugged, slippery, muddy, rocky, overgrown terrain - Carrying heavy equipment, packs, safety gear, first aid - Helicopter rescues - Water rescues - Climbing / rock climbing 	<ul style="list-style-type: none"> - Abrasion resistance (thorns, rocks, sticks) - Stretch - Thermal regulation - Moisture wicking - Odor resistant - Durability - Long life cycle (limited uniform allowance each year)
<p>Fire Suppression</p> 	<ul style="list-style-type: none"> - High heat - Remote locations - Lifting heavy equipment - Earing heavy protective gear - Walking, hiking, running 	<ul style="list-style-type: none"> - Non-flammable material properties - Thermal regulation - Moisture wicking - Odor resistant - Durability - stretch

<p>Interacting with Wildlife</p> 	<ul style="list-style-type: none"> - running, walking - hiking - traffic control / crowd control - if in backcountry, navigate rugged terrain - standing for long periods of time - Riding in cruiser 	<ul style="list-style-type: none"> - Thermal regulation - Moisture wicking - Odor resistant - Stretch - Wrinkle-resistant - Stain-resistant - Durability - Abrasion resistance (thorns, rocks, sticks)
<p>Working in Isolation</p>  	<ul style="list-style-type: none"> - Long distance walking, hikes, uphill climbing - Navigate rugged, slippery, muddy, rocky, overgrown terrain - Carrying heavy equipment, packs, safety gear, first aid - Carrying radio/phone/means of communication 	<ul style="list-style-type: none"> - Abrasion resistance (thorns, rocks, sticks) - Stretch - Thermal regulation - Moisture wicking - Odor resistant - Durability - Long life cycle (limited uniform allowance each year) - User friendly / easy cleaning requirements - Repairable (fixes for rips, holes, wear) - Stain-resistant

Storage Needs

Depending on a Rangers role, items or equipment they will need to carry for the day and storage needs will vary. Based on feedback, on a typical day a Ranger could be carrying the following items:

<i>Clipped to Belt</i>	<i>Clipped to Belt or Pocket</i>	<i>In Back or Side Pockets</i>	<i>(Optional) Back Pack</i>
<ul style="list-style-type: none"> - Bear Spray (varies by park) - Keys - Pocket CPR mask (can be clipped to key ring) 	<ul style="list-style-type: none"> - Radio - Satellite phone 	<ul style="list-style-type: none"> - Personal Phone - Wallet - Index Cards or program information 	<ul style="list-style-type: none"> - Map / Compass - Program props - First Aid Kit

Product Research

It is important to note that uniforms will vary slightly from park to park. The specific park uniform is often determined by supervisors in charge.³

Current Supplier

VF Imagewear / R&R Uniforms. There is one catalog that National Park Service employees order from.

Current Products & Sizes Available¹⁹

<p><i>Shirts:</i> Dress Field Lightweight Work Turtleneck</p>	<p><i>Pants, Shorts & Skirts:</i> Dress Trousers Field Twill Trousers Brush Pant Cargo Shorts Dress Skirts Jeans Convertible Trousers Cargo Trousers</p>	<p><i>Maternity</i> Shirt Trousers</p>
<p><i>Outerwear:</i> Work Jacket GORE-TEX Waist Length Shell & Liners Field Jacket & Liner Dress Coat Service Dress Jacket Windbreaker Gaiters GORE-TEX Hip Length Shell & Liners GORE-TEX Hood</p>	<p><i>Volunteer Items:</i> Fleece Jacket Unisex GORE-TEX Overshell GORE-TEX Hood</p>	<p><i>Accessories:</i> Headwear Ties & Tie Tack Dress Coat Buttons Gloves & Belts Socks Name Plates Footwear</p>

Rain Coat Rain / Wind Pant Insulated Vest Pullover Sweater Cardigan Sweater Fleece Jacket Coveralls		
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The following items will be considered for redesign during this project:



SERVICE DRESS
65% polyester / 35% combed cotton,
permanent-press tropical.
Men's
NP1112 Long Sleeve.....[N430]
NP1118 Short Sleeve.....[N428]
Women's
NP1115 Long Sleeve.....[N456]
NP1123 Short Sleeve.....[N454]



WORK SHIRT
65% polyester / 35% combed cotton, permanent-press poplin
Men's
NP1100 Long Sleeve w/Name Tag..... [N600]
NP1104 Short Sleeve w/Name Tag..... [N431]
65% polyester / 35% combed cotton, permanent-press poplin
Women's
NP1103 Long Sleeve w/Name Tag..... [N457]
NP1107 Short Sleeve w/Name Tag..... [N601]



FIELD SHIRT
65% polyester / 35% combed cotton,
permanent-press poplin.
Men's
NP1120 Short Sleeve..... [N432]
Women's
NP1124 Short Sleeve..... [N458]



LIGHTWEIGHT SHIRT
65% polyester / 35% combed cotton,
permanent-press tropical.
Men's
NP1001 Long Sleeve.....[N698]
Women's
NP1115 Long Sleeve.....[N699]



FIELD TWILL TROUSERS

65% polyester / 35% combed cotton,
8 oz. permanent press twill

NP2102 Men's [N658]

NP2103 Women's..... [N659]



BRUSH PANT

10 oz. 100% cotton duck cloth

NP2216 Men's [N563]

NP2217 Women's..... [N581]



FIELD TWILL TROUSERS

65% polyester / 35% combed cotton,
8 oz. permanent press twill

NP2102 Men's [N658]

NP2103 Women's..... [N659]



DRESS TROUSERS

Winter

55% polyester / 45% wool, 16 oz. elastique

NP2100 Men's[N554]

NP2104 Women's.....[N576]

Summer

55% polyester / 45% wool, 11 oz. tropical

NP2101 Men's[N554]

NP2105 Women's..... [N575]



**WAIST-LENGTH
THINSULATE® LINER**
100% nylon-liner fabric with 200 gram
Thinsulate® in body, 150 gram Thinsulate®
in sleeves
NP3168 Unisex Liner [N351]



FLEECE JACKET
100% recycled plastic ecologically-sound
EcoSpun® fleece
NP3005 Unisex without Badge Tabs.... [N703]
NP3006 Unisex w/Badge Tabs..... [N704]

Special Size Note included in the catalog indicates you can order sizes “outside the ranges listed” and they require a minimum of 60-90 days.¹⁹

Final Design Direction

At the beginning of the project the following items were being considered for redesign: short and long sleeve uniform shirt, field pants and the insulated winter jacket.

It was determined that two items for summer weather and two items for winter weather will be the focus of redesign. See below for the updated catalog photos of the final items (taken from the 2016 NPS uniform catalog.)

- 1) Summer – short sleeved uniform shirt
- 2) Summer – cargo shorts
- 3) Winter – coverall / bibs
- 4) Winter – field jacket



FIELD SHIRT

65% polyester/35% combed cotton, permanent-press poplin

Men's

NP1120 Short Sleeve..... (N432)

Women's

NP1124 Short Sleeve..... (N458)



CARGO SHORTS

65% polyester/35% combed cotton,8 oz. twill

NP2143 Men's(N636)

NP2142 Women's(N637)



FLEECE JACKET (SYSTEM)

100% recycled plastic ecologically-sound fleece

NP3005 Unisex without Badge Tabs....(N703)

NP3006 Unisex w/Badge Tabs.....(N704)



BIB COVERALLS

100% cotton, 10 oz. duck cloth, quilted nylon lining



NP3190 Unisex..... (N691)



Price

The National Park Service employees who are required to wear the uniform receive an annual uniform allowance. Uniformed employees receive an allowance of \$400 per year, the level set in 1988. Employees are responsible for paying for cleaning and care of their uniforms.³

Anatomy of the NPS Female Uniform

Features & Benefits

<p>Long and Short Sleeve Uniform Shirts</p> 	<p>Large front breast pockets for quick access to essential items. (Can be cumbersome on the female body)</p> <p>Additional fabric where badge is placed to help it stay put. This had been corrected from previous problems with the material in past female uniforms</p> <p>Standard dress shirt collar and buttoned center front closure with crisp lines create a clean look and help the rangers look professional. The shirts for men and women are cut to be a loose fit that the ranger can easily move around in.</p> <p>Long and short sleeve options for thermoregulation in warm and cool temperatures.</p> <p>Shirt is hip length so it can be neatly tucked in to the pants for a professional appearance.</p>
<p>Short Sleeve Uniform Shirt*</p> 	<p>Large front breast pockets for quick access to essential items. (Can be cumbersome on the female body)</p> <p>Additional fabric where badge is placed to help it stay put. This had been corrected from previous problems with the material in past female uniforms</p> <p>Standard dress shirt collar and buttoned center front closure with crisp lines create a clean look and help the rangers look professional. The shirts for men and women are cut to be a loose fit that the ranger can easily move around in.</p>

	<p>Short sleeves for thermoregulation in warm temperatures.</p> <p>Shirt is hip length so it can be neatly tucked in to the pants for a professional appearance.</p>
<p>Cargo Shorts*</p> 	<p>Shorts are longer in length which provide more protection to the legs while keeping you cool.</p> <p>Multiple pockets on front, side and back of legs for storage options.</p> <p>Large cargo pockets on the side of each leg can be use to store multiple items.</p> <p>High wasted shorts help keep shirt tucked in while you perform your every day tasks.</p>
<p>Field Trousers</p> 	<p>the material and simple cut allows the pants to easily be hemmed shorter.</p> <p>Elastic waistband is meant to create a fit that stays put when you are moving and performing duties.</p> <p>Front and back pockets for storing personal items. Pockets are pretty deep for women's pants because they were taken down from men's sizing.</p>

Bib Coveralls*



Unisex sizing makes it possible for a wider range of people to wear the bib coveralls.

The bibs are insulated to keep the wearer warm in the colder weather.

Long front zipper makes getting in and out of the bib coveralls easier.

High front and back bib panels provide full coverage and help keep shoulder straps in place as you perform your tasks.

Large pockets on the front bib allow for easy access to essential items.

Waterproof / water resistant materials keep you dry in wet weather.

Field Fleece Jacket*



Jacket is heavy and warm for cold weather.

Wrists are fitted so there is no interference with tasks.

The jacket has an option hood in case you need extra protection from wet weather or high winds.

Ranger Hat



Wide, stiff brim for shielding eyes against the sun and rain.

Hat is a staple image of the NPS Rangers and make them immediately recognizable in case someone is needing to find a ranger quickly.




**Indicates final item chosen for redesign*

Materials

- See Images in *Final Design Direction* section above.

Manufacturing: Assembly

- VF Imagewear / R&R Uniforms.

<p>Long and Short Sleeve Shirts*</p>  	<p>Pattern pieces are machine cut and sewn. This is a high quantity (large batch) item.</p> <p>Special sizes are available but take 60-90 days to get be delivered.¹⁹</p> <p>The lines on the front of the shirt are created by gluing the fabric. The glue is used like a piping material.</p> <p>No liner is used, fabric is double up when reinforcement is needed (i.e. at badge holes)</p> <p>Edges of pattern pieces are surged before final product is put together.</p> <p>A top stitch is used for all visible finished (hem, zipper, pockets, etc.)</p>
<p>Cargo Shorts*</p> 	<p>Pattern pieces are machine cut and sewn. This is a high quantity (large batch) item.</p> <p>Edges of pattern pieces are surged before final product is put together. Legs are seam together using a flat felled seam.</p> <p>Pockets and zipper received a liner prior to piecing.</p> <p>A top stitch is used for all visible finished (hem, zipper, pockets, etc.)</p>

Field Trousers



Pattern pieces are machine cut and sewn. This is a high quantity (large batch) item.

Edges of pattern pieces are surged before final product is put together. Legs are seam together using a flat felled seam.

Pockets and zipper received a liner prior to piecing.

The crisp folds (crease) on the front and back of the pants is made by gluing the crease in place.

Edge of the pants are left raw and hemmed to length needed.

A top stitch is used for all visible finished (hem, zipper, pockets, etc.)

Bib Coveralls*





Pattern pieces are machine cut and sewn. This is a high quantity (large batch) item.

Pattern pieces are large and boxy to address the unisex fit and allowing garments to be worn under the bib coveralls.

Edges of pattern pieces are surged before final product is put together.

Two different materials are used: quilted nylon inner lining and 100% cotton duck cloth shell.

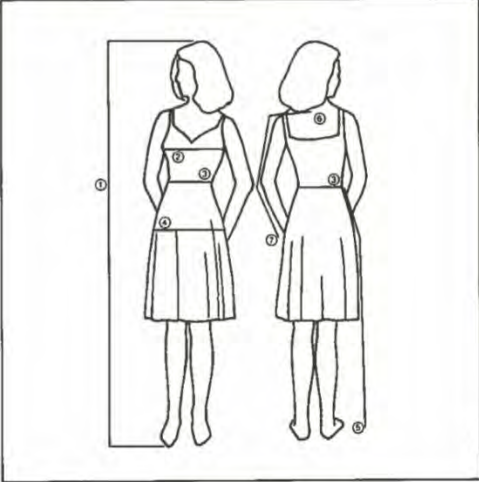
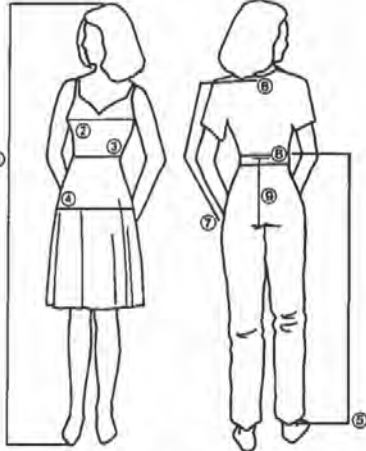
A top stitch is used for all visible finished (hem, zipper, pockets, etc.)

<p style="text-align: center;">Field Jacket*</p> 	<p>Pattern pieces are machine cut and sewn. This is a high quantity (large batch) item.</p> <p>Two different materials are used: inner fleece and outer shell. The outer shell material is also used to line pockets.</p> <p>A top stitch is used for all visible finished (hem, zipper, pockets, etc.)</p>
 <p style="text-align: center;">Ranger Hat</p>	<p>Each hat is custom made to order.²⁰</p> <p>Stratton Hats are available in four different head shapes, Regular oval, Long oval, Extra-long oval, and Wide oval.²⁰</p> <p>Straw (Summer): The hat comes standard with a pyramid pattern of three eyelets on each side of the crown. It comes standard with no badge hole; however, a badge hole can be added if desired.²⁰</p> <p>Felt (Winter): Felt hats are made on a forming machine. The top of the hat is made first into a large loose cone then shrunk and shaped on a forming machine.²⁷</p> <p>This style hat comes standard with a diamond pattern of four eyelets on each side of the crown (not shown). It also comes standard with no ribbon; however, a ribbon can be added if desired. Finally, it comes standard with no badge hole, however a badge hole can be added if desired.²⁰</p>

**Indicates final item chosen for redesign*

Manufacturing: Fitting and Measurements

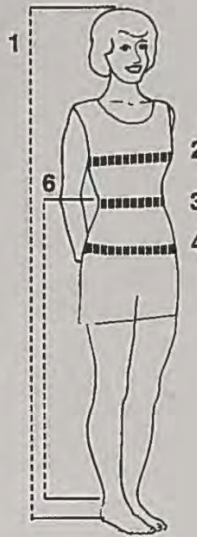
The manufacturer provides instructional charts in order for the individual to determine the size of uniform that they should order. The following are the female specific instructional charts from the NPS uniform catalogs with the year indicated. (Note: The years and catalogs are based on the most up to date information provided by the NPS Uniform Collection Curator in February 2020.)

Year (Manufacturer)	Measurement Chart
1981 (R&R Uniforms)	<p style="text-align: center;">FEMALE</p> <p>HOW TO MEASURE FOR SIZE: HAVE SOMEONE ELSE MEASURE YOU. KEEP TAPE STRAIGHT, BUT NOT TIGHT. MEASURE OVER UNDERGARMENTS OF OTHER CLOTHING TO BE WORN UNDER YOUR UNIFORM.</p> <ol style="list-style-type: none"> 1. HEIGHT: STAND STRAIGHT AGAINST WALL IN STOCKING FEET. MAKE A MARK LEVEL WITH TOP OF HEAD. MEASURE FROM THIS POINT DOWN TO THE FLOOR. (SHOE HEELS CAN ADD INCHES TO YOUR HEIGHT). 2. BUST: MEASURE AROUND FULLEST PART OF BUST, HOLDING TAPE GENTLY. KEEP TAPE STRAIGHT AND LEVEL. 3. WAIST: MEASURE AROUND THE SMALLEST PART OF NATURAL WAISTLINE, HOLD TAPE FIRM, BUT NOT TIGHT. KEEP TAPE LEVEL AND BE SURE TO STAND NATURALLY. 4. HIPS: MEASURE AROUND THE FULLEST PART OF HIPS. HOLD THE TAPE MEASURE FIRM, BUT NOT TOO TIGHT. KEEP THE TAPE MEASURE STRAIGHT AND LEVEL. 5. OUTSEAM: PUT ON THE SHOES YOU PLAN ON WEARING. MEASURE FROM 3 TO 5, OR EXACTLY WHERE YOU WOULD LIKE YOUR SLACKS TO HIT ON YOUR SHOE. 6. SLEEVE: MEASURE FROM POINT 6 AT BACK OF NECK BRINGING TAPE OVER POINT OF SHOULDER TO POINT 7 ON WRIST WHERE YOU WOULD LIKE SLEEVE TO HIT. 
1990 (R&R Uniforms)	<p>all uniforms sold are in regular rise.</p> <p style="text-align: center;">FEMALE</p> <p>HOW TO MEASURE FOR SIZE: Have someone else measure you. Keep tape straight, but not tight. Measure over undergarments or other clothing to be worn under your uniform.</p> <ol style="list-style-type: none"> 1. HEIGHT: Stand straight against wall in stocking feet. Make a mark level with top of head. Measure from this point down to the floor. (Shoe heels can add inches to your height). 2. BUST: Measure around fullest part of bust, holding tape gently. Keep tape straight and level. 3. WAIST: Measure around the smallest part of natural waistline, hold tape firm, but not tight. Keep the tape level and be sure to stand naturally. 4. HIPS: Measure around the fullest part of hips. Hold the tape measure firm, but not too tight. Keep the tape measure straight and level. 5. OUTSEAM: Put on the shoes you plan on wearing. Measure from the top of waistband, point 8, to exactly where you would like your slacks to hit on your shoes, point 5. 6. SLEEVE: Measure from point 6 at back of neck bringing tape over point of shoulder to point 7 on wrist where you would like sleeve to hit. 7. RISE: Trousers are sometimes made in petite, regular, and tall. This refers to rise and is illustrated in point 9. If you believe you wear either a long rise or short rise please measure both inseam and outseam making note of both on order form. We will then be able to determine proper rise. Please remember 95% of uniforms sold are in regular rise. 

1991 – 1996
(R&R
Uniforms)

FEMALE

1. **HEIGHT:** Stand straight against wall without shoes. Make a mark level with top of head. Measure from this point down to the floor.
2. **BUST:** Measure around fullest part of bust, holding tape gently. Keep tape straight and level.
3. **WAIST:** Measure around the smallest part of your waistline, holding tape firmly, but not tightly. Keep the tape level and be sure to stand naturally.
4. **HIPS:** Measure around the fullest part of hips. Hold the tape measure firmly, but not tightly. Keep the tape straight and level.
5. **SLEEVE:** Measure from middle of back of neck at point 5, across the shoulder and around point of elbow to wrist at point 5a.
6. **OUTSEAM:** Put on the shoes you plan to wear with your uniform. Measure from the top of waistband, point 3, over the hips to exactly where you would like your slacks to touch your shoe. Slacks should be hemmed 1" from top of shoe heel.



2004
2006
2007
2008
(VF Imagewear
VF Solutions)

How to Measure

Before ordering, take your measurements to insure that you select the correct size for each uniform item. Each item has its own size chart and requires that you select your size based on your measurements. We have designed the garments to accommodate body size. The size information listed are not how large the garment is, it is the body size that will comfortably fit that size. For best fit, please follow the measuring instructions carefully. We recommend having another person assist you. Taking your own measurements increases the chance for error.

HEIGHT (1): Stand straight against the wall without shoes. Make a mark level with top of head. Measure from this point down to the floor.

NECK (2): Measure a shirt collar that fits you well. Lay collar flat. Measure from center of collar button to far end of the buttonhole. OR measure around neck where buttoned shirt would fit. Allow for two fingers' width between tape measure and neck.

CHEST/BUST (3): Measure just under arms across shoulder blades at fullest part of chest or bust and back, holding tape firm and level.

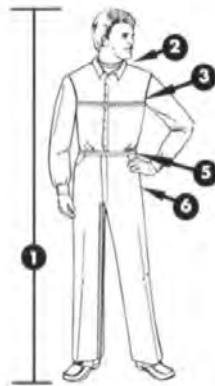
SLEEVE (4): With arm relaxed at side and slightly bent, measure from center back of neck to across the shoulder around point of elbow to wrist bone.

WAIST (5): Measure over shirt but not over pants, around waist where you normally wear pants. Keep tape level, but not tight.

HIPS (6): Measure around fullest point of seat while standing, keep tape level.

INSEAM (7): Measure a well fitting, similarly styled pair of pants. (Do not measure blue jeans.) Lay them flat, with the front and back creases smooth. Measure from the crotch seam along the inseam to the bottom of the hem. Styles worn with higher heels require extra length.

NOTE: Incorrect inseam measurement is the #1 reason for returns.



2009
(VF Imagewear
VF Solutions)

HOW TO MEASURE

Before ordering, take your measurements to ensure that you select the correct size for each uniform item. Each item has its own size chart and requires that you select your size based on your measurements. The garments are designed to accommodate body size. The size information listed is not how large the garment is, it is the body size that will comfortably fit that size. For best fit, please follow the measuring instructions carefully. It is recommended to either have another person assist you or have your measurements taken professionally. Taking your own measurements could increase the chance for error.

HEIGHT (1): Stand straight against the wall without shoes. Make a mark level at top of head. Measure from this point down to the floor.

NECK (2): Measure a shirt collar that fits you well. Lay collar flat. Measure from center of collar button to far end of the buttonhole, or, measure around neck where buttoned shirt would fit. Allow for two fingers' width between tape measure and neck.

CHEST/BUST (3): Measure just under arms across shoulder blades at fullest part of chest or bust and back, holding tape firm and level.

WAIST (4): Measure over shirt but not over pants, around waist where you normally wear pants. Keep tape level, but not tight.

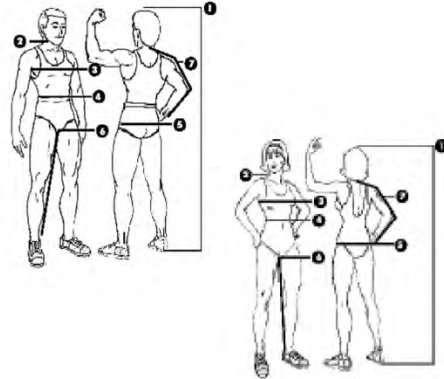
HIPS (5): Measure around fullest point of seat while standing, keep tape level.

INSEAM (6): Measure a well-fitting, similarly-styled pair of pants. (Do not measure blue jeans.) Lay them flat, with the front and back creases smooth. Measure from

the crotch seam along the inseam to the bottom of the hem. Styles worn with higher heels require extra length.

SLEEVE (7): Bend elbow and bring hand close to upper body. Start at the center back of the neck and measure across the shoulder to the elbow and to the wrist bone.

NOTE: Incorrect inseam measurement is the #1 reason for returns.



2013
2016*
(VF Imagewear
VF Solutions)

HOW TO MEASURE

Before ordering, take your measurements to ensure that you select the correct size for each uniform item. Each item has its own size chart and requires that you select your size based on your measurements. The garments are designed to accommodate body size. The size information listed is not how large the garment is, it is the body size that will comfortably fit that size. For best fit, please follow the measuring instructions carefully. It is recommended to either have another person assist you or have your measurements taken professionally. Taking your own measurements could increase the chance for error.

HEIGHT (1): Stand straight against the wall without shoes. Make a mark level at top of head. Measure from this point down to the floor.

NECK (2): Measure a shirt collar that fits you well. Lay collar flat. Measure from center of collar button to far end of the buttonhole, or, measure around neck where buttoned shirt would fit. Allow for two fingers' width between tape measure and neck.

CHEST/BUST (3): Measure just under arms across shoulder

blades at fullest part of chest or bust and back, holding tape firm and level.

WAIST (4): Measure over shirt but not over pants, around waist where you normally wear pants. Keep tape level, but not tight.

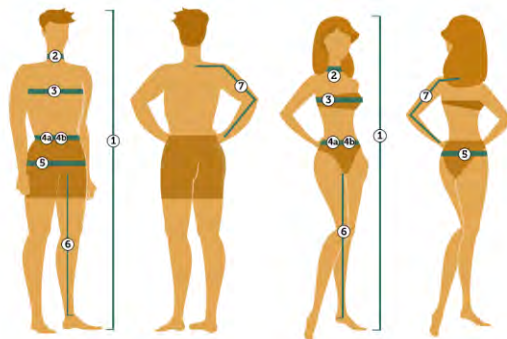
HIPS (5): Measure around fullest point of seat while standing, keep tape level.

INSEAM (6): Measure a well-fitting, similarly-styled pair of pants. (Do not measure blue jeans.) Lay them flat, with the front and back creases smooth. Measure from the crotch seam along the inseam to the bottom of the hem. Styles worn with higher heels require extra length.

SLEEVE (7): Bend elbow and bring hand close to upper body. Start at the center back of the neck and measure across the shoulder to the elbow and to the wrist bone.

NOTE: Incorrect inseam measurement is the #1 reason for returns.

*2016 is the last year that NPS uniform catalogs were printed. All ordering is now done online.



My Measurements

Height (1) _____
 Neck (2) _____
 Chest/Bust (3) _____
 Waist (4) _____
 Hips (5) _____
 Inseam (6) _____
 Sleeve (7) _____

Patent & Intellectual Property

National Park Service Ranger Uniforms cannot be bought by the general public or those employees not in a role where uniforms would be required.

Badge and patch cannot be represented in movies.

Graphics, Logo and Color Application

Park Ranger Badge



National Park Service Arrowhead







The arrowhead was authorized as the official National Park Service emblem on July 20, 1951.

The elements of the emblem symbolize the major facets of the National Park Service:

- Sequoia tree = vegetation
- Bison = wildlife
- Mountain and water = scenic and recreational values
- Arrowhead – historical and archeological values

To forestall unseemly commercial uses of the arrowhead design, an official notice, approved March 7, 1962, was published in the Federal register designating it as the official symbol of the National Park Service.¹⁸

Colors

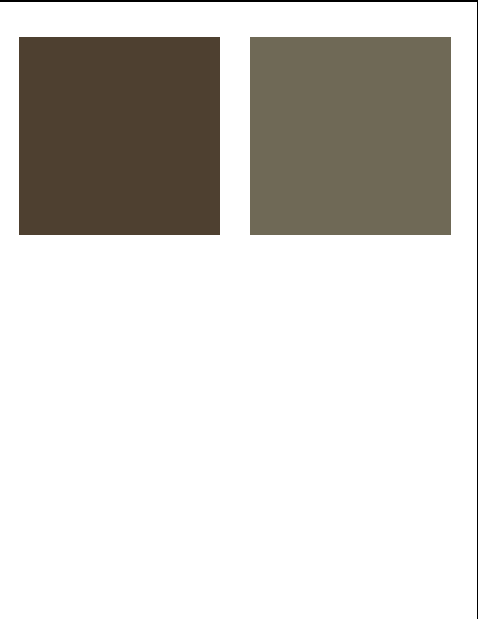
<p>Patch:</p> <p>Brown Light green Forest green White</p>		
<p>Shirt (Long and Short Sleeve, Men's and Women's):</p> <p>Sand Brown/Gray</p>		

<p>Cargo Shorts Men's and Women's):</p> <p>Forest Green</p>		
<p>Pants (Men's and Women's):</p> <p>Fatigue Green</p>		
<p>Winter Bibs (Unisex):</p> <p>Exterior Shell: Olive Green</p>		

Fleece Jacket
(Unisex):

Interior Liner:
Brown

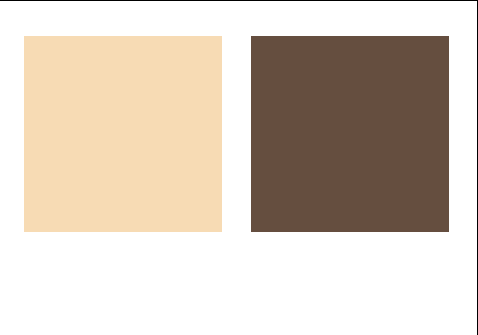
Exterior:
Fatigue Green



Ranger Hat:

Exterior:
Tan

Band:
Brown with
USNPS
stamped on it



Ranger Hat

The symbol that people often associate with rangers is sometimes incorrectly called the “Smokey the Bear” hat. Smokey the Bear actually belongs to the U.S Forest Service, not the National Park Service.⁵

Originally made by Stenson, the hat is now made by Stratton, but is still sometimes referred to as a Stenson. It is also called a flat hat and is listed in the uniform catalog as “Ranger Hat”.






Other Considerations



Specific to the uniforms – as a comment, not a rule – the uniforms must have the appearance of authority. The Ranger must be immediately recognizable as official law enforcement.



SWOT Analysis


SWOT Analysis for NPS Female Rangers Uniforms at the Grand Canyon


Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
Pants – Winter ¹⁹ 	Full Range of Women’s Pants Sizes is unknown: Currently know that sizes 10 – 14 exist although the number to measurement scale is not similar to pants currently on the market from other companies.	Thicker fabric for colder weather Front and back pockets for holding small personal items	65% polyester / 35% combed cotton ¹⁹ No Stretch Professional dry clean only Unflattering Storage / pockets Waistband is tight	Adjustable Waistband 4 way stretch material Material care Water repellent material finish Wind resistance	Government regulations Budget restrictions Range of sizes that can / should be provided How many types of materials can be sourced? Where can materials be sourced – USA made?
Comparison #1: Eddie Bauer First Accent, Guide Pro Pants \$80 ²¹ 	Regular: 0 – 18 Petite: 2-16 Tall: 6 - 20 Plus: 16W – 24W Care Machine wash cold with like colors; tumble dry low	UPF 50+ Water Repellant Finish Secure Pocket (w/Zipper) Lightweight Two Way Stretch Nylon/Spandex Bluesign© Certified Sustainable Fabric	Online Reviews: ²¹ Need more stretch Logo is too big	Addition of 4 way stretch materials. Different materials on different panels of pants Additional of panels to make fit better Removal of logo / subtle logo	Addition of materials and different construction processes could drive up cost / price How to keep branding / logo without compromising look

<p>Comparison #2: REI Co-op Activator V2 Soft Shell Pants – Women’s \$99.95²²</p> 	<p>Regular 2 - 16</p>	<p>63% nylon / 26% polyester/11% spandex</p> <p>Bluesign® approved fabric</p> <p>50 UPF Sun protection</p> <p>Soft shell, durable nylon exterior</p> <p>Water resistant treatment</p> <p>Wind resistant to 35 mph</p> <p>Articulated knees and center gusset</p> <p>Daisy-chain waistband adjustment</p>	<p>Online Reviews:²²</p> <p>Front pockets are shallow</p> <p>Construction issues / seems ripping at the crotch</p> <p>Waist fit is tight</p> <p>Built in belt with metal buckle / needs looser setting</p> <p>Seems around the knees stick out and rub on skin</p> <p>Waist too low for action</p>	<p>Larger pockets for better storage</p> <p>Better construction / quality assurance</p> <p>Better proportions</p> <p>Remove built in belt</p> <p>Relocate seams around the knee</p> <p>Create a higher, more secure waist</p>	<p>Larger pockets could not be the “look” some customers are wanting / could make the pants look more masculine</p> <p>Need a new way to secure / adjust waist if belt is removed</p> <p>Moving seams at knees could create issues else ware</p>
Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
<p>Pants – Summer ¹⁹</p>	<p>Full Range of Women’s Pants Sizes is unknown:</p> <p>Currently know that sizes 10 – 14 exist although the number to measurement scale is not similar to pants currently on the market from other companies.</p>	<p>Lighter fabric weight than the winter pants for the hot summers</p>	<p>No sweat wicking characteristics</p> <p>No stretch</p> <p>Professional dry clean only</p> <p>Unflattering</p> <p>Storage / pockets</p> <p>Waistband is tight</p>	<p>Adjustable Waistband</p> <p>4 way stretch material</p> <p>Material care</p> <p>Water repellent material finish</p> <p>Sweat wicking</p>	<p>Government regulations</p> <p>Budget restrictions</p> <p>Range of sizes that can / should be provided</p> <p>How many types of materials can be sourced?</p>


				<p>Quick dry</p> <p>Articulated knees</p> <p>Insect shield / poison ivy shield</p>	<p>Where can materials be sourced – USA made?</p>
<p>Comparison: Patagonia Women's Quandary Pants \$79²³</p> 	<p>Regular: 0-22 32" inseam</p> <p>Short: 0-22 30" inseam</p>	<p>95% nylon / 5% spandex</p> <p>Water repellent</p> <p>50+ UPF sun protection</p> <p>Secure zipper closures</p>	<p>(Online Reviews)²³</p> <p>Pants show sweat</p> <p>Drawstring needs to be more robust</p> <p>Drawstring can rub</p> <p>Make thigh pocket larger to fit phone</p> <p>Stretch over time</p>	<p>Different material</p> <p>Different colors so sweat does not show</p> <p>Bigger drawstring or belt in a new location (flip to the outside)</p> <p>use daisy chain waist band instead of drawstring</p> <p>larger pockets for phones / think about placement of the larger pockets</p>	<p>Better materials could drive up cost / price</p> <p>Bigger drawstring could cause more rubbing</p> <p>Moving drawstring to outside could cause the "look" to be unappealing</p> <p>Bigger pockets could look clunky or placed awkwardly on the body</p>

Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
<p>Cargo Shorts ¹⁹</p> 	<p>Full range of sizes is unknown.</p> <p>Currently have a female size 16 sample.</p>	<p>Large pockets for storage.</p> <p>Great option for summer weather when pants are too hot,</p>	<p>65% polyester / 35% combed cotton</p> <p>Unisex sizing does not fit female proportions.</p> <p>The waistband is often too tight or high.</p>	<p>Adjustable Waistband</p> <p>4 way stretch material</p> <p>Sweat wicking</p> <p>Quick dry</p>	<p>Government regulations</p> <p>Budget restrictions</p> <p>Range of sizes that can / should be provided</p>
<p>Comparison</p> <p>REI Co-op Savanna Trails Shorts - Women's \$44.95²⁸</p> 	<p>XS – XL</p> <p>Inseam 5"</p> <p>Midrise</p>	<p>94% nylon/6% spandex (bluesign® approved)</p> <p>Stretchy nylon/spandex fabric is breathable, moisture wicking, cool and abrasion-resistant</p> <p>Durable water repellent (DWR) finish fends off light rain and spills</p> <p>Elastic back waistband has a drawstring for an adjustable, comfortable fit</p> <p>Wide waistband is hipbelt-compatible</p> <p>Front and rear pockets keep</p>	<p>(Online reviews) ²⁸</p> <p>They tend to run big.</p> <p>The two upper side pockets are huge and run all the way down the leg so anything you put in them slides to the bottom hem. Difficult to reach anything you store there</p> <p>Adjustable drawstring waistband tends to “Dig in”</p> <p>Plastic snaps on rear and front small pockets hard to open/close with one hand.</p>	<p>Adjust cargo pockets layering.</p> <p>Add zippers to pockets</p> <p>Thicker material option for waistband adjustability</p> <p>Metal snaps instead of plastic</p>	<p>Additional of higher quality / more expensive closures could drive up cost</p>



		<p>you well-supplied out there</p> <p>UPF 50+ fabric offers excellent UV protection</p>			
Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
<p>Shirt – Short sleeve¹⁹</p> 	<p>Full range of sizes is unknown.</p> <p>I do know S, M, L, XL sizes exist. Women and men's sizing is differentiated but the difference in comparable sizes is unknown.</p>	<p>Shorter sleeve length for the warmer weather</p> <p>Longer so the shirt can be tucked in for a professional look</p> <p>Weight of material can support a nametag and badge</p>	<p>65% polyester / 35% combed cotton; permanent press poplin¹⁹</p> <p>No stretch</p> <p>Not moisture wicking</p> <p>Not fitted for women</p> <p>Collar – irritating</p> <p>Non-breathable</p> <p>Pockets – are they practical?</p>	<p>Sweat wicking</p> <p>Breathable</p> <p>Quick dry material</p> <p>Sleeve length & shape</p> <p>Odor resistant fabric</p> <p>No buttons</p> <p>No collar</p> <p>Sun protection</p> <p>Pocket placement</p>	<p>Government regulations</p> <p>Budget restrictions</p> <p>Range of sizes that can / should be provided</p> <p>How many types of materials can be sourced?</p> <p>Where can materials be sourced – USA made?</p>
<p>Comparison</p> <p>Columbia Tamiami II Long Sleeve (roll up sleeve) \$70²⁴</p>	<p>XS - XL</p>	<p>100% Quick dry polyester</p> <p>Stretch</p> <p>Enhanced Range of motion on arms</p> <p>Back vent</p> <p>UPF 40 sun protection</p>	<p>(Online Reviews)²⁴</p> <p>Sizes tend to run small</p> <p>Interior mesh panels are white and not attractive</p> <p>Need a petite version</p>	<p>Addition of sizes</p> <p>Better method for securing sleeves / add tabs to both sides</p> <p>Change colors of interior mesh to coordinate</p>	<p>More tabs on the sleeves could rub on the inside of the arm</p> <p>More mesh colors would drive up cost/price</p>


		<p>Antimicrobial treatment</p>	<p>Sleeves won't stay in place when rolled</p> <p>Too form fitted</p>		
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Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
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<p>Jacket – Winter ¹⁹</p> 	<p>Full range of sizes is unknown. The jacket is unisex and it is known that S, M, L are available.</p>	<p>100% recycled plastic ecologically-sound EcoSpun fleece¹⁹</p> <p>Fitted / ribbed material at wrist keeps hands free of interference</p> <p>Simple; there are no extra pockets or tabs hanging off the coat that could get caught</p>	<p>Color not noticeable in wooded area / camouflage</p> <p>Build is bulky and may be too heavy / intrusive for smaller frames</p>	<p>Better insulation materials that would allow for a slimmer / less bulky fit</p> <p>Addition of pockets on the interior for phone and non-emergency items</p>	<p>Government regulations</p> <p>Budget restrictions</p> <p>Range of sizes that can / should be provided</p> <p>How many types of materials can be sourced?</p> <p>Where can materials be sourced – USA made?</p>
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<p>Comparison</p> <p>Carhart Weathered Wildwood Jacket \$100²⁵</p>	<p>XS – 2XL</p>	<p>Sherpa lining in body</p> <p>Quilted-nylon lining in sleeves</p>	<p>(online reviews)²⁵</p> <p>Sleeves too short, jacket too big</p>	<p>New proportions, lengthen sleeves and bring in waist</p> <p>More mobility in</p>	<p>More size options could drive up cost / price</p> <p>More mobility and</p>
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		<p>Detachable, Sherpa lined, 3-piece hood</p> <p>Pocket options inside and out</p>	<p>Rides up constantly</p> <p>Too large in the shoulders</p> <p>Need to be offered in tall</p> <p>Too tight in arm pits and chest</p> <p>Awkward cut</p>	<p>the shoulders to keep the jacket from moving and riding up every time you move your arms</p> <p>Offer more sizes</p>	<p>different cut would be a completely different jacket; may not be the “look” they were aiming for.</p>
Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
<p>Winter Bibs¹⁹</p> 	<p>Unisex sizing</p>	<p>100% Cotton, 10 oz duck cloth</p> <p>Quilted nylon lining</p>	<p>Unisex sizing</p> <p>Bulky material can make it more difficult to walk and perform tasks</p> <p>No stretch</p>	<p>Offer better fit with more size variations</p> <p>Add stretch and articulation to make movement easier</p> <p>Explore new fabrics and insulation to add warmth without adding bulk</p>	<p>Government regulations</p> <p>Budget restrictions</p> <p>Range of sizes that can / should be provided</p> <p>How many types of materials can be sourced?</p> <p>Where can materials be sourced – USA made?</p>

<p>Comparison</p> <p>The North Face Freedom Bib Snow Pants – Women’s \$199²⁹</p> 	<p>XS – XL</p> <p>Standard Fit Inseam 32”</p>	<p>Outer Shell: Nylon</p> <p>Liner: Polyester</p> <p>Inner-thigh vents shed excess body heat</p> <p>1 zippered bib pocket; 2 open bib pockets; 2 zippered hand pockets; 2 flap cargo pockets</p> <p>Side-entry zip; adjustable suspenders; belt loops</p> <p>StretchVent™ gaiters with gripper elastic and boot hook help keep snow out of your boots</p> <p>Reinforced kickpatches protect pants from abrasion</p>	<p>(Online Reviews)²⁹</p> <p>Fabric won't hold up to rough wear.</p> <p>These pants are not offered in short or long sizes.</p>	<p>Reinforced fabric at critical points on the legs to avoid rips and tears.</p> <p>Offer different lengths or adjustability in the legs for length.</p> <p>Adding a little stretch in the legs so the between size people can fit easier.</p>	<p>There are higher end options of these pants available. Adding too many features to these would drive the price up too close to their high-end options.</p> <p>Too many types of fabrics can drive up costs.</p>
Item Description	Sizes Available	Strengths	Weaknesses	Opportunities	Threats
<p>Stratton Uniform Hat (Smokey Hat)</p> <p>Summer Straw Hat²⁰ \$96 - \$113 6-1/2” to 7-7/8”</p>	<p>Measure you head before ordering¹²</p> <p>Hats are sized similar to fitted baseball caps where you measure your head before purchasing.</p>	<p>Immediately noticeable as a park ranger</p> <p>One of the most recognizable symbols of the National Park Service</p>	<p>Too big, sometimes you have out newspaper in the top so it does not fall down your head¹²</p> <p>Impractical to wear in the woods</p>	<p>Water resistant / quick drying</p> <p>Comfortable band</p>	<p>Long history with the hat</p> <p>Associated with authority</p>

 <p>Alternate Winter Hat (Felt)²⁰ \$149 6-1/2" to 7-7/8"</p>	<p>Sizes 6-1/2" to 7-7/8" are available on Strattonhats.com²⁰</p>		<p>because it gets caught on trees¹²</p> <p>Uncomfortable after 20 mins¹²</p>		
<p>Comparison</p> <p>Outdoor Research Bugout Mojave Sun Hat – Women’s \$55²⁶</p> 	<p>21.5 – 24 in head circumference</p>	<p>100% cotton</p> <p>Sun protection</p> <p>Infused with insect shield</p> <p>Soft shell</p> <p>50+ UPF sun protection</p> <p>Cinch cord for adjustable fit</p> <p>Quick dry</p> <p>Moisture wicking</p>	<p>Sweat stain resistance</p> <p>Odor resistance</p>	<p>Different cord for secure fit with better next to skin feel</p> <p>Mesh panels for better air flow</p>	<p>Does not have the “look” of authority</p> <p>Keep cost low for a simple hat; don’t add unnecessary items</p>

PART 2

Prompt: Explain how this product topic aligns to your strengths as a product innovator.

Jenny's core strengths as a professional include the ability to keep track of multiple projects, overall organization and willingness to learn from others with more experience. As a student Jenny has strong skills in research, patterning and attention to detail. Specific to the outdoors, Jenny is an avid hiker with lots of experiences and knowledge of outdoor safety. She has completed courses in wilderness first aid and has done multiple backpacking and backwoods trip. Specific to this thesis topic, Jenny's previous experience with ROTC means she can relate on a high level with those women in the field who wear a similar uniform and she has great respect for those rangers putting their lives in danger to keep the public safe. She will not take the design of their uniforms lightly.

These strengths will assist Jenny in defining the issues clearly in the current uniforms by researching the history of the product, the National Park System and the women how have served and are serving as rangers. Having previously worn a similar uniform, Jenny will be able to listen, relate and define the issues that the women currently have with the uniforms and address those issues to the best of her ability.

With the aim of ending up in the outdoor industry, this project present Jenny with opportunities to show her strength in designing in a rugged outdoor environment for female National Park Service Rangers (athletes) with a unique set of skills and restrictions. This project will allow Jenny to develop and refine skills in many areas of the design process including: apparel construction, technical apparel design, women's-specific research and fit, material and fit testing and designing within a tight set of restrictions.

PART 3 – Field Work

Harpers Ferry Visit

Tuesday, Jan 14th at 10am

Meeting with Nancy Russell; main contact at the uniform collection at Harpers Ferry

Physical location of the NPS History Collection:

31 Maple Tree Drive

Charles Town, WV 25414

Interview / Meeting with Nancy:

Questions / Topic	Notes / Comments
Looks like Nancy is an Archeologist – ask her how she got interested in the park service museum and what she does day to day.	<ul style="list-style-type: none"> • 23 years in the park service, has always been in an archeology position • right now, she is working on a project to sort and archive all uniforms. They hope to get an exhibit together for the 50th anniversary of the uniforms (?) 2021 • Whenever a new round of uniforms is ordered / changes are made, she asks Ramie for a complete set – one of every item in the catalog – this does not always happen • She showed me the pen that was used by president () to sign the establishment of the national park system
When you take key measures – see if you can measure a few sizes – so you can see the size grade (the difference between measures between sizes). Make a spec sheet you bring with you, so you are filling in a document,	She is sending me catalogs that she has from previous years with size charts / “how to find your size” charts shown
Ask Nancy when the last re-design was done, I’m really curious is the uniforms really haven’t changed since 1980	Nothing has drastically changed since the 1980s – there will be slight differences in items like buttons, pockets, zippers, etc. but no redesign (see notes from visit with Ramie. <ul style="list-style-type: none"> • She did note that Secretary Jewel has been very involved with moving forward with new uniforms
Ask her ahead of time if you can take pictures	Yes! Will upload to google drive.
Ask if she knows how ppl alter the uniforms to fit better	I did ask her specifically about hemming the uniforms – do they come hemmed or do you have to get them altered <ul style="list-style-type: none"> • She said that you order them at a certain length and they come already altered; she seems to think it was a little different in the past just because there were not as many options for women and they really were wearing the men’s uniform
Ask her what issues she’s heard ppl talk about with the uniforms	

<p>I asked her if people wanted a new uniform? There has been so much struggle to get to wear the same uniform as the men – do they want a new uniform or a better fitting?</p>	<p>Her initial thought was that people wanted better <u>fitting</u> uniforms, female specific</p>
<p>Typical areas of damage on the uniforms in her collection (take pics)</p>	<ul style="list-style-type: none"> • She tends to see more soiling than damage, but items that come to her are in pristine condition because they are going to be archived. • She said it also depends on the materials of the uniforms • She sees wear or damage from the badges / name tags when the garment does not have a badge holder. The badges have had a variety of connections – pin, loop through, magnetic, sewn on (see interview with Ramie)
<p>What rangers perceive as their favorite item of the uniform (from her knowledge)</p>	<ul style="list-style-type: none"> • The hat • The badge • The colors of the uniform, they are distinctive to the national park service and are immediately identifiable
<p>What wouldn't you change about the uniform?</p>	<ul style="list-style-type: none"> • Color scheme • Badge • Hat • Belt – designed in connection with the hat band • Certain safety features and modifications that are specific to certain uniforms / positions (i.e. maintenance uniforms do not have • The fancy brass buttons with the eagle on them have not changed since the 1930s
<p>Her thoughts on how to make the uniforms</p>	<ul style="list-style-type: none"> • She really liked Lee jeans (her and her friends would talk about this.) The uniform pants before had little elastic and not much stretch • She said she did not want elastic waisted grandma pants but would have liked more stretch • Also had the common problem of pants fitting in the legs but there being a gap at the back of the waistband • Also mentioned she would like to see a new dress shirt – maybe that the epilates could go and make the shirt a little less formal. They serve no purpose for the park serve since they do not have ranking badges any more, it is symbolic at this point • Zippers on the back of a jacket to hold field notebook • Maybe cargo pants / shorts options, convertible zip off options
<p>Find out if the materials have to be made out of certain fibers. Like why are the pants wool and can't be a nylon stretch woven?</p>	<p>See interview with Ramie in next section</p>

<p>Find out what other manufacturers made uniforms in the past (look in the hang tags of old uniforms).</p>	<p>See interview with Ramie in next section</p>
<p>Ask if she knows of anyone else that you should speak to.</p>	<ul style="list-style-type: none"> • Potential of putting something on the National Parks Service Facebook page • Uniform committee – Potential of asking Ramie who is / was on the uniform committee and who has field tested the new 2019 uniforms.
<p>If asked for her initial reactions to the UK uniforms (collaboration with Columbia.)</p>	<ul style="list-style-type: none"> • She said that they are practical for the climate they are working in • But they do not portray authority • She lived in the UK for a while – she said that the national parks in the UK tend to have communities still living in them, they did not depopulate the parks when dedicating land to a national park, where as in the US we tend to kick people off the land that is being reserved for the national park • The uniforms in the UK reflect that attitude of them being more part of a community, rather than the policing / authoritative roles that US Park Rangers have to take on • A general note: She spoke a bit about the changed in roles of the park rangers over time – it has become more authoritative than informative. All rangers used to be well versed in the history of the park they were working in but that is not really the case with most law enforcement rangers these days. The parks in general seem to be more about policing than the actual activity / information.
<p>Cost of uniforms</p>	<ul style="list-style-type: none"> • Also has not changed since the 1980s (See interview with Ramie for follow up) • She did say when she first started and was buying her uniforms, she was able to buy a few summer and winter sets but was not able to afford a coat – she had to wear a generic green coat that she purchased for herself
<p>Need to know what the uniform requirements/ standards are if any (shirts must have 2 chest pockets, a collar, buttons, short sleeves that extend to the elbow, a place for a name tag, badge etc., Pants pocket requirements, color requirements.)</p>	<p>See interview with Ramie in next section</p>

<p>Are there any no-no's - things that are unacceptable on the uniform?</p>	<ul style="list-style-type: none"> • They tend to see a “drift from standards”; there are memos that come out reminding everyone of the dress code and how they are to represent the parks • Uniform coat with civilian clothes • You are not supposed to wear any part of the uniform with civilian clothing • nontraditional Socks / arrowhead socks – this one is funny because she said she would have to have arrowhead socks, not just the boring brown ones • In my interview with Ramie he said they could wear their own socks (I think he meant it more as a “if we aren’t able to see them”
<p>What type of closures are being used on shirts, jackets, and pants: buttons vs. snaps on shirts, zippers and pocket closures on jackets, cuffs – how are they finished: turned hem, Velcro adjustment tab, button placket opening, how are pocket closures on jackets and pants handled? Velcro, snap, zipper, nothing.</p>	<ul style="list-style-type: none"> • Jacket sleeve – parka sleeve closure with Velcro • Velcro on zipper of outerwear • String closure around parka hood • Buttons – uniform buttons with the eagle on them, shirt there is a standard little button • Buttons on the pants / back pocket flaps
<p>Summer / Winter uniforms</p>	<ul style="list-style-type: none"> • Summer / winter divide in the uniform – doesn’t really address the climate differences in the US • Addresses look verses function • the summer pants don’t look very comfortable – she talked about how the summer pants may work for some parks but would be awful in summer in the desert • she also said – why not fleece lined pants in the coldest parks? • There is flexibility on when summer starts and ends in each park – the timeframe when they are allowed to start wearing summer uniforms • Catalogs will be helpful to see differences in looks / materials – at the moment it seems that material weight is usually the defining factor.
<p>Have there been any uniforms that were problematic for the wearer? Durability, quality, tearing, pilling, not breathable enough</p>	<p>See history of the uniform section of research paper</p>
<p>Take note of specific details: badges, pocket styles, buttons, zippers, pocket size / depth / placement</p>	<p>See photos in section below</p>
<p>Take note of colors and change in pallet throughout the years. The</p>	<ul style="list-style-type: none"> • There has never been a specific NPS green or color pallet in my interview with Ramie he said that this was finally

<p>one uniform that jumped the most was the beige uniforms and they did not go over well, are there other colors to avoid?</p>	<p>defined in these 2019 uniforms. In the past when multiple manufactures provided the uniforms, there was a lot of issues with non-standard colors and the park employees not matching</p> <ul style="list-style-type: none"> • “think about everyone lined up and none of the uniforms match? That looks awful” – Ramie (not a direct quote) • I would like to look into the issues of the blending of the uniforms across the department of the interior. Nancy said different departments are starting to blend – like the BLM are taking on the NPS uniform – need to double check this. She did not think this is a good idea – the NPS has always had a very distinct look / color palette (see also, pride in the uniform)
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Other: Unknown / waiting on spec sheets from Nancy

- For shirt specs, also get waist, hip and armhole length
- Get dimensions on the most current pants – to make sure they are like the ones you have
- For the jacket, take the same measures as the shirt. Also, pockets.
- Totally get the size charts or any sort of materials information
- Key measurements:
 - a. TOPS: Chest width, sweep width, sleeve length, front and back body length, pkt dimensions, # of snaps or buttons on the front.
 - b. BOTTOMS: waist, low hip 8” down from top of waist, front and back rise, thigh, knee, and leg opening. Is there a crotch gusset? What shape is it/ dimensions?

Tuesday, Jan 14th at 2 pm
 Meeting with Ramie Lynch, uniform project manager for NPS
 Location: 1849 C Street NW, Room 2550, Washington, DC 20240

Interview / Meeting with Ramie:

Questions / Topic	Notes / Comments
Ramie's background	<ul style="list-style-type: none"> • Has been working with uniforms for the past 18 years • Before that he was a ranger – was stationed in DC for a while at the Mall
<p>Notes on the new uniforms / What is latest process of designing / ordering the uniforms? Have the uniform measurements changed over the years or are they still similar to those used in the 1980s?</p>	<p>Ramie has been working on this project Since 2014. In the summer of 2015, they conducted an online survey that identified the top 3 things people had an issue with:</p> <ol style="list-style-type: none"> 1. Shoes 2. Shirts 3. Pants <p>Employee feedback indicated that they wanted breathable fabrics, the latest and greatest technology and “stuff that will fit us”</p> <p>In summer of 2015 they held an Industry day where they invited vendors and uniform companies to determine:</p> <ul style="list-style-type: none"> • what are the constraints? • what are they capable of? • What is possible with the government? <p>They (meaning Ramie and the government) changed the way they approached the bid / design process:</p> <ul style="list-style-type: none"> • In the past they used technical specs and told the manufacturers how/what to make • This time they stopped using technical specs and use performance specifications instead • They asked the vendors what are new innovative technologies and capabilities then let vendors and manufacturers tell them what they could do • They did give a few guidelines: When possible they wanted to use commercial off the shelf items. If they could be made in the NPS colors they wanted to adopt that process / item <p>New materials: Will get a complete list but the items I got to see are a cotton poly blend and had ripstop materials.</p> <p>“Iconic Look, Modern Feel”</p>

<p>How did they improve / change sizing for this new uniform?</p>	<p>Sizing – they “used the latest patterns and industry standards”</p> <ul style="list-style-type: none"> • They told the manufacturers to use “True male / true female sizing” (told me to google it for the full definition but that these would match industry standard) <ul style="list-style-type: none"> ○ This is being used for pants and shirts, male and female; with the exception of specialties • When possible, they used commercial off the shelf so the sizing would be determined by what is already in existence • VF Imagewear is in the process of making a sizing chart to go along with the new collection (will probably not be done for a few months. • “A lot more males than females” to outfit • Outwear sizing is still unisex; would have been 50% increase to go with male / female sizing <ul style="list-style-type: none"> ○ This includes socks, gloves, hats, accessories
<p>What is the process of ordering the uniforms? What criteria did VF Imagewear meet in order to get the contract with NPS?</p>	<p>2017 – contract awarded VF Imagewear (has had the contract for approximately 30 years)</p> <ul style="list-style-type: none"> • In the past there has been about 4-5 bids for the contracts. There are so many special restrictions they put on the contractor that it usually scares people off. • There are a few companies that team up to produce a complete bid <p>VF was awarded the most recent contract for a few reasons:</p> <ul style="list-style-type: none"> • They are a one stop shop – shirts, pants, hats, belts, etc. They work directly with their vendors to supply everything for the national park service • Items must be shipped directly to employee / differs from the military where everything is sent to one place and then distributed and tracked by the military (uniforms remain government property), the address’ can be extremely remote and incomplete and delivery must be fast / on time
<p>I asked if there were restrictions such as everything having to be made in America</p>	<ul style="list-style-type: none"> • The “buy American / trade agreements act” • I need to look up the specific wordage but it means that any country US has a free trade agreement with the NPS can use • The military is different; everything is made in America period • <u>FAR</u> – need to look up exact wordage but in general it is an exceptions clause to the “Buy American” requirements (i.e. clothing would potentially be “Made in China”. They (NPS) used to be able to use this exception but are no longer allowed because employees would complain to Congress

	<ul style="list-style-type: none"> ○ Congress determined that the NPS were no longer allowed to take exceptions and it has made the new process a lot more difficult <p>Example (I asked about Columbia/UK and VF Imagewear owning North face):</p> <ul style="list-style-type: none"> • Companies like Columbia / north face sportswear have their products made in countries that the NPS cannot do business with • They asked North Face (because they are owned by VF Corporations) if they would be willing to move their factories to compliant locations • North Face was willing to move and be compliant but they said they would not remove any of their branding • The government cannot co-brand; it would be like they were endorsing North Face <p>He did say they had one victory – the were able to include an Apex Windbreaker – North face knockoff in their catalog. It is made in the same factory with the same specs but the branding is removed.</p>
<p>If there were new design changes who would approve them?</p>	<p>Not sure of the chain of command but uniform committee and Ramie would be involved</p>
<p>Are there any restriction on materials that the uniforms can be made of besides cost? Colors?</p>	<p>Colors: (See notes above) This is the first time they have defined the NPS green and gray</p>
<p>Are there restrictions on design for the uniforms apart from cost? Colors? Placement of patch/badge? Pockets? Belt?</p>	<p>The restrictions seem to be more based in tradition and cost. The color is iconic, the badge and name tags are specific to the uniforms</p> <ul style="list-style-type: none"> • The new backcountry / specialty / “fishing shirt” uniforms have a sewn-on badge • The name tags on the new ranger shirts can be sewn on but it is optional – many of the rangers do not like the sewn-on name because they are the same as the maintenance workers • The leather belt and hat band have the same stamp / design and are specific to the NPS
<p>What are the most common complaints you hear about the uniforms? Men and women vs women only.</p>	<p>See earlier answer: “Big 3” Shoes Pants Shirts</p>
<p>New uniform wear testing</p>	<ul style="list-style-type: none"> • Uniforms are sent to a sample size of employees – sometimes randomized, sometimes specific (like when wanting to test in a certain climate)

	<ul style="list-style-type: none"> • Employees have 30 days to wear the samples, they are asked to wear the uniform as much as possible • An online survey is conducted at the end of the period • He typically sees about 50-60% response rate • The success rate: 60% of employees have to be happy with them or it is “back to the drawing board” Each round of wear testing will take a few months • The most recent dress shirt went through 3 different wear tests
<p>Is the yearly allowance still \$400 for uniforms? What is it applied to (shoes, hats, clothes?) and what does this typically allow you to buy? How much do pants, shirt and jackets cost?</p>	<p>(See also interview with Nancy)</p> <ul style="list-style-type: none"> • With the new uniforms that dropped in December 2019 it was approved to increase the uniform allowance by 50%. So instead of the \$400 allowance (Set in 1980s), it is now \$600 • They also update the footwear policy to where the employees are allowed to buy their own. The new footwear is more expensive as well. • Dec 2019 – when uniforms dropped: pants and shirts, more dropping in March/April 2020 • Following the second drop in March / April 2020 they will focus on outerwear
<p>Is there a current size chart for the uniforms for the rangers to reference? I know they mentioned extended sizes – what is available?</p>	<p>The specialty order is called “Made to measure”</p> <ul style="list-style-type: none"> • In the portal you submit your measurements to the manufacturer; it is recommended to get professionally measured – there are no returns • It is provided at no added cost • Typically take 90-120 days • Available on everything - Shoes, outerwear, pants, shirts, hats, etc.
<p>How much leeway do the rangers have with their uniforms? Is final say in uniform left to the park and park manger? Dependent on the park?</p>	<p>(See interview with Nancy)</p> <ul style="list-style-type: none"> • It sounds like some parts / managers will let things slide but as Nancy said they often get emails reminding everyone to comply • They do let the parks make judgement calls on when they employees are allowed to wear summer clothing
<p>What are the features or details of the uniform that rangers are most proud of? What is something that should not be changed in designs going forward?</p>	<ul style="list-style-type: none"> • Hat • Wearing the uniform in general
<p>Challenges they face</p>	<ul style="list-style-type: none"> • Selling on eBay • The NPS uniform is considered personal property and technically can be donated but not sold for profit

	<ul style="list-style-type: none">• The US Park police uniform is government property• I also asked about “impersonating a ranger” like in the movies; he said the shirt and pants and colors are fine because there are a lot of park systems that wear the same or similar colors – the hat, belt, and arrow head are the property of the NPS and can’t be used
Random Ramie thoughts / Misc.	<ul style="list-style-type: none">• The official socks are a nice Smartwool hiking sock; Ramie sees a spike in sales around Christmas “stocking stuffers”• HE HAD A PARKS PROJECT FANNY PACK! The one that you showed me that they were submitting to Outdoor Retailer – I asked him about it and he said “there is a story behind why I got involved, do you want to hear the story?”• Apparently one of the National Parks (who he said shall remain nameless) cleaned out their uniform stash and gave them to the Parks Project people. They just asked and the Park gave them over. And Parks Project was advertising them as being made from “Official National Park Service” uniforms that had been worn in the field.• Ramie said they made the Parks Project People take the “NPS” off the description but they could still say they were made from ranger uniforms; they even offered to get the Parks Project People in touch with the manufactures to see if they would have scraps of fabric from the pants when they were manufacturing but they weren’t interested. The National Park who gave up the uniforms “should have known better” and got in big trouble. So, you will no longer see the bags with the NPS association The Parks Project people didn’t get in any trouble other than having to change the description.

Harpers Ferry Visit / Uniform Collection Pictures with Notes (See Appendix A for pictures):

Picture #	Description	Notes / Comments
1	Patches	Rangers used to have specific patches they would wear depending on their positions <ul style="list-style-type: none"> • Chief Ranger, Assistant Chief Ranger, Ranger, Park Engineer, etc. • There is a patch that was submitted as a possible design for the park naturalist but was not implemented – it is embroidered with a white bear because the manufacturer did not have brown thread
2	US Park Police Patches	
3 – 5	Pill box hats	Some of the hats were from the same time period but different manufacturers would add their own details like quilted details
6	Leather hat bands	
7 – 8	The infamous tan uniform	1970 - 1974 (make sure those are the correct years) <ul style="list-style-type: none"> • Tan dress uniforms • Orange pop overs were meant to be worn by the volunteers over their civilian clothes • Picture of the drawer pulled out – camping sleeping mattress and blanket • She told me to look up Horace Albright second book about the founding of the National Park system
9	Riding Uniform (men's)	- Men's uniform but was known to be worn by women as well; see early pictures in my history timeline in research paper
10	Field Uniform – Pants (men's)	Pants with stirrups on the bottom for wearing with boots
11	Field Uniform – Jacket (men's)	<ul style="list-style-type: none"> • She told me that this particular style had two zips on the sides that essentially turn the back of the coat into one big storage pocket – for field notebook, etc., • Practical zips on the pockets of the pants
12	Field Jackets with badges	
13	Women's hats	<ul style="list-style-type: none"> • Top hat is the “ranger” style hat that was specifically made for women to go with the 1970 tan uniforms, it is different from the men's ranger hat • The bottom hat is a prototype hat that was “Thankfully” (Nancy) never put into circulation
14	Women's skirt and jacket	<ul style="list-style-type: none"> • This was the 1961 (similar to the 1962 version that is on the mannequin in later pictures) • Shown with pill box hat – this version of the hat did not have the arrowhead, it says US NPS
15 – 16	Tan uniforms	<ul style="list-style-type: none"> • This was the first pant suit option that was offered to women

		<ul style="list-style-type: none"> There was a centennial dress option with was worn briefly and Nancy believe that it was made in the same bright pattern as the scarf
17 – 18	Tan uniforms / striped option	<ul style="list-style-type: none"> “Unfortunately, at least one person had to wear it” Nancy when talking about the striped option; there is a picture next to it showing a woman wearing it
19	Tan smock option	<ul style="list-style-type: none">
20	1950s style	<ul style="list-style-type: none"> White shirt and green skirt
21 – 22	Ike Jacket ~ 1980	<ul style="list-style-type: none">
23 – 24	Lifeguard uniforms	<ul style="list-style-type: none"> Nancy told me that a two-piece option got approved to be worn in the new collection
25	Ike jacket	<ul style="list-style-type: none"> 1980s Notice the badge holder Great collar
26	“McDonalds” uniform	<ul style="list-style-type: none"> Looks more like a waitress uniform Notice how bright the green is; also, the arrow head is outlined in white
27	Tan uniform with jacket	<ul style="list-style-type: none">
28	Stewardess uniform	<ul style="list-style-type: none"> The 1962 version (the 1961 version was in the drawer) Tiny badge
29	1950s	<ul style="list-style-type: none"> With tie “badge”

New 2019 Uniform

Picture #	Description	Notes / Comments
30 – 31	Field work “jeans”	<ul style="list-style-type: none"> Double layer knee patch Cell phone / radio pocket Hammer loop
32 – 33	“Fishing” shirt	<p>This is considered a specialty shirt and would be used on the hottest climates</p> <ul style="list-style-type: none"> Both the badge and the name tag are sewn on because the material is so light weight Feels like a Coleman fishing shirt; extremely light weight quick dry material Back has a vent flap
34 – 35	Cardigan options 1 and 2	<p>These items are currently in wear testing stages</p> <ul style="list-style-type: none"> The employees wanted an updated cardigan / jacket to wear indoors This would be more at a desk job or at visitor centers where the wearer is inside all day
36 – 37	Standard / dress shirt	<p>Mesh paneling in the back, adds venting and additional motion</p> <ul style="list-style-type: none"> I forgot what technology he called this – need to find name

38	Updated arrowhead	Even the arrowhead got an upgrade; they wanted to see if current manufacturers could do a modern version with “shading” to match the logo
39	Field sweater	Heavier sweater with liner made for colder temperatures <ul style="list-style-type: none"> • Notice badge and nametag reinforcement
40 – 42	Standard uniform shirt	<ul style="list-style-type: none"> • Mesh paneling alongside of shirt and under arm • Articulation at back of shoulders
43 – 44	Rain proof hat	<ul style="list-style-type: none"> • Gortex
45	Standard baseball cap	<ul style="list-style-type: none"> •
46	Uniform socks	<ul style="list-style-type: none"> • Smartwool
47 – 48	Uniform pants (men’s)	<ul style="list-style-type: none"> • field pants • hidden zipper cargo pockets • small flat cut at bottom of side pockets for clipping radios • hidden stretch waistband; adjusts at the waistband just about side pockets (this waistband is not available on the women’s pants although everything else is the same – I don’t know why they decided this, but employees have already complained and said they wanted them on the women’s pants as well so they have the manufacturer working on those. • mesh, gusseted crotch
49 – 50	Lighter weight uniform pants	<ul style="list-style-type: none"> • dress trousers • mesh side panels provide venting and stretch • mesh gusseted crotch

Current Uniforms for Baseline Testing (Purchased from eBay)

Female, Uniform Short Sleeve Shirt



Female, Uniform Field Pants



Unisex, Field Jacket



PART 4 – Design Priorities

Jobs to be done

Summer Shirt	Summer Shorts
<ul style="list-style-type: none"> • keep cool / thermal regulation • comfort: sleeves (360 arm movement) • comfort: across chest • comfort: across back • sweat wicking (identify sweat zones) • spf/sun protection (materials) • breathable material / air flow & venting • protect arms & shoulders against back pack straps • fit comfortably under pack • fit comfortably under rain jacket / vest • professional appearance • does it need to address personal safety of the wearer? • Hold badge / name tag (sewn on badge is an option) • Allow movement such as walking with trekking poles, lifting things, bending, stretching, reaching • Doesn't stick to skin when sweaty • Stretch • Loose enough not to show bra / straps • Wilder fit across the shoulders – can there be adjustability • Must fit wide range of bodies 	<ul style="list-style-type: none"> • keep cool / thermal regulation • comfort: thighs / hips • comfort: waist • comfort: across back of waistband • allow movement: running / walking, squatting, kneeling, lifting, climbing, stepping up, bending over stretching • wick sweat (identify sweat zones) • breathable / airflow • protect against abrasions. Resistance to branches, etc. • sand / dirt resistant (?) • sun / spf protection • professional appearance • does it need to address personal safety of the wearer? • Storage: radio, cellphone, handkerchief, pen/notebook • Flashlight • Will they always be wearing a pack? • Belt loops – uniform belt is a source of pride • Doesn't stick to sweaty skin • Stretch • Loose enough not to show panty lines • Optional storage? Detachable / modular

Winter Bibs / Coveralls	Winter Field Jacket
<ul style="list-style-type: none"> • Keep warm and dry • Wick sweat (map sweat zones) • Retain body heat • Wind resistant • Comfort – thighs / hips, waist, shoulder straps, across chest, across back / butt, ankles at boots • Abrasion resistance (map areas) – twigs, trees, boot kick plates • Waterproof / water resistance 	<ul style="list-style-type: none"> • Assume being used for snow, wind, rain & sun • Keep warm & dry – venting? • Wick sweat (identify sweat zones) • Retain body heat • Comfort – sleeves (360 arm movement), across chest / back • Length at sleeves and torso • Not too bulky, easy to move in • Allow movement – walking, bending, lifting, fit under pack • Abrasion resistance – rocks, trees, sand • Water proof / resistance

<ul style="list-style-type: none"> • Allow movement – walk, jog, hike, climb, big steps, stretching, lifting, bending over, kneeling, squatting • They need to fit over pants / shorts / leggings • Storage – will replace pants storage, should there be access to base layer pockets? • Optional additional storage? Modular? • Carrying: bear spray, keys, notebook, pens • Does this need to address personal safety of the wearer • Range of motion at hips, thighs and knees • Length – do not want to trip over hem, must work with boots 	<ul style="list-style-type: none"> • Rain hood? Winter hood? • Fit over shirt, long & short sleeve, sweater? • Professional appearance • Hold badge and nametag • Does this need to address personal safety of the wearer? • Storage: flashlight, gloves, hat, hand warmers, phone, radio • Will they be wearing a pack for storage? • Stretch • Venting and breathability • Reflective • Wind resistance
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Final Top Design Priorities:

Summer Shirt

1. Mobility
2. Thermoregulation
3. Fit / fit across range of sizes
4. Professional appearance

Coveralls / Bibs

1. Mobility
2. Thermoregulation
3. Fit / fit across range of sizes
4. Storage

Summer Shorts

1. Mobility
2. Fit / fit across range of sizes
3. Storage
4. Thermoregulation

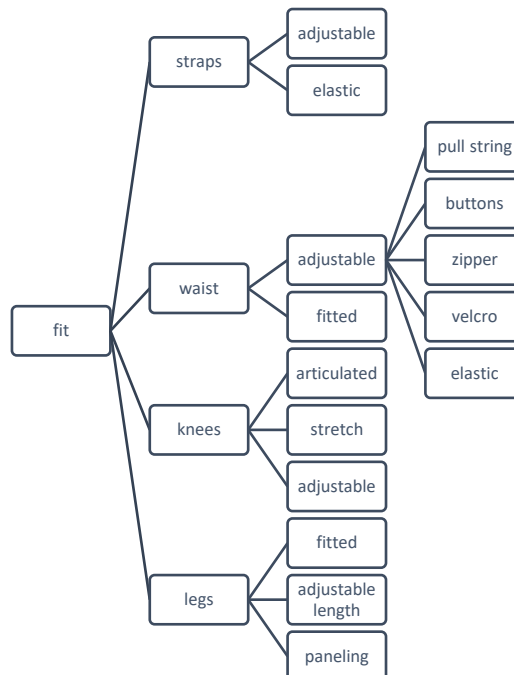
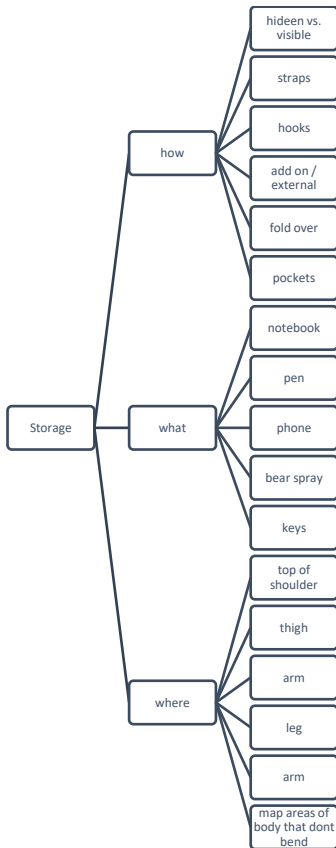
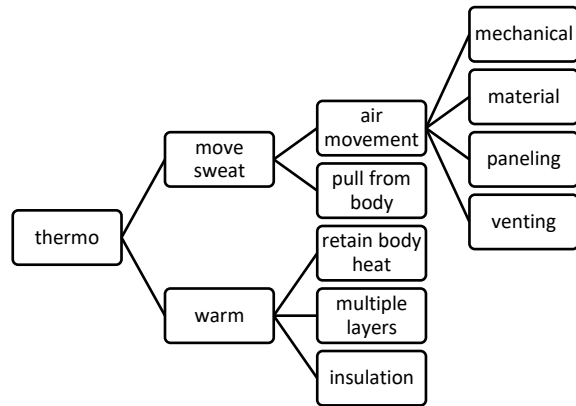
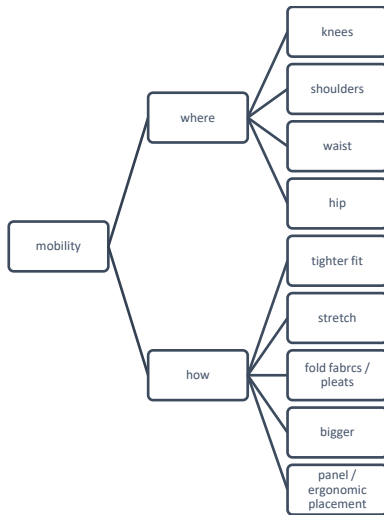
Jacket

1. Mobility
2. Thermoregulation
3. Fit / fit across range of sizes
4. Storage

PART 5 – Ideation Process

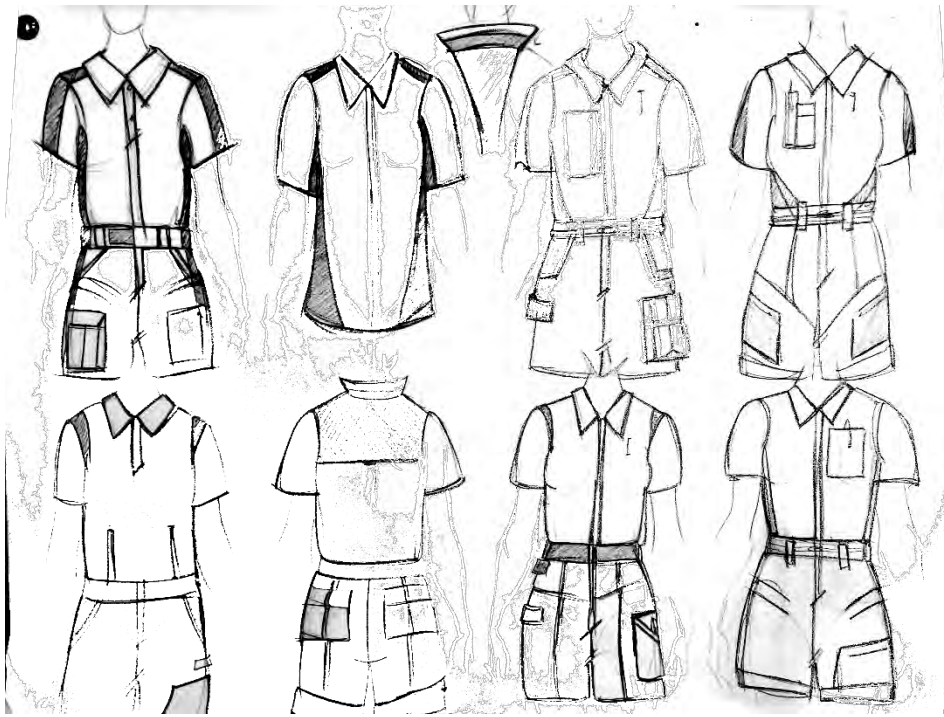
Ideation Process 1: Mind mapping – coveralls

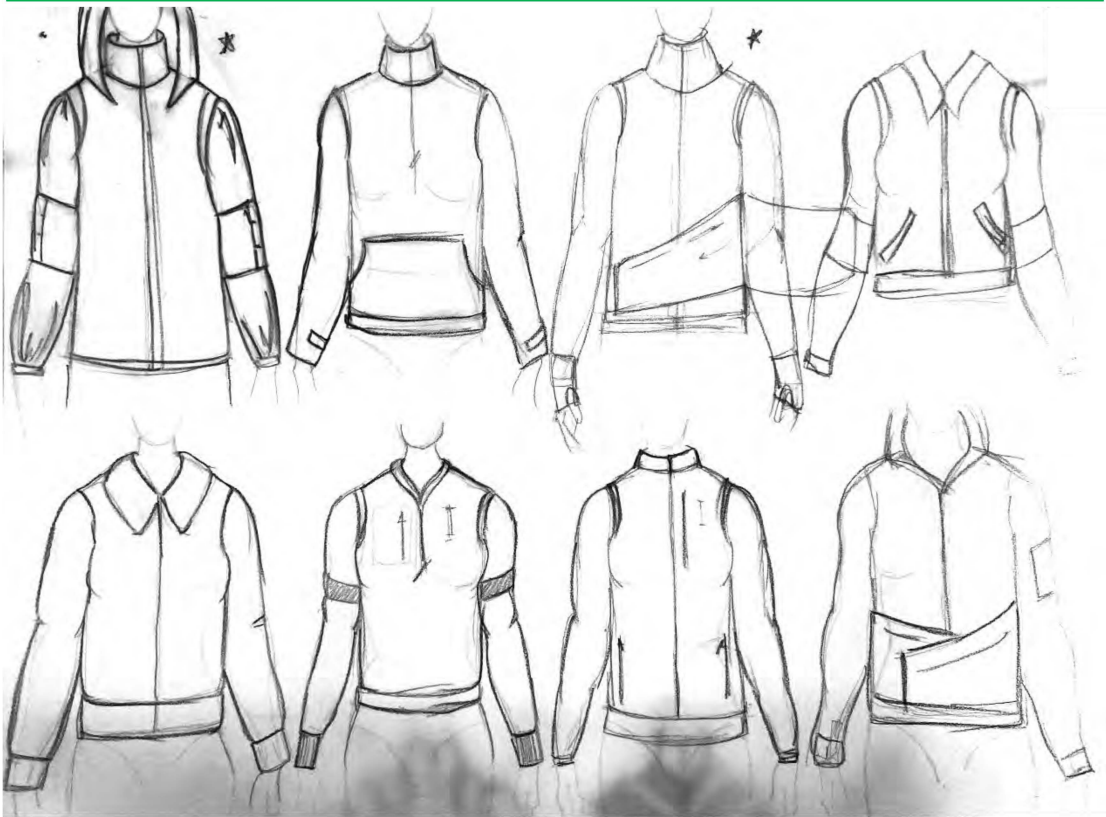
Mind maps of each item were made to determine all aspects of the design that could be addressed. These mind maps were then used to create sketches for each aspect. (For example: coveralls -> mobility -> where -> knees).

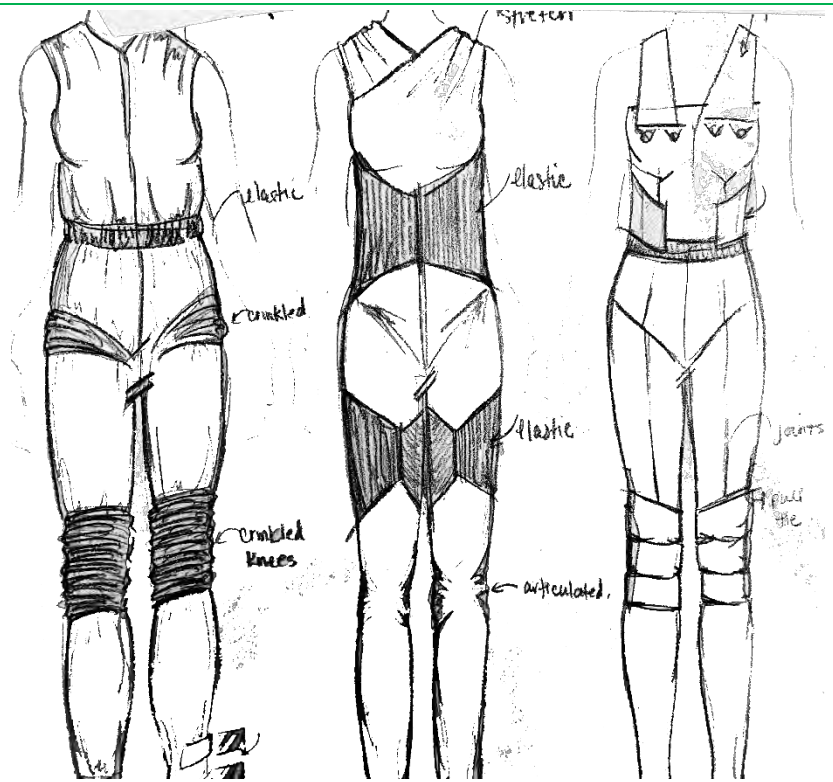
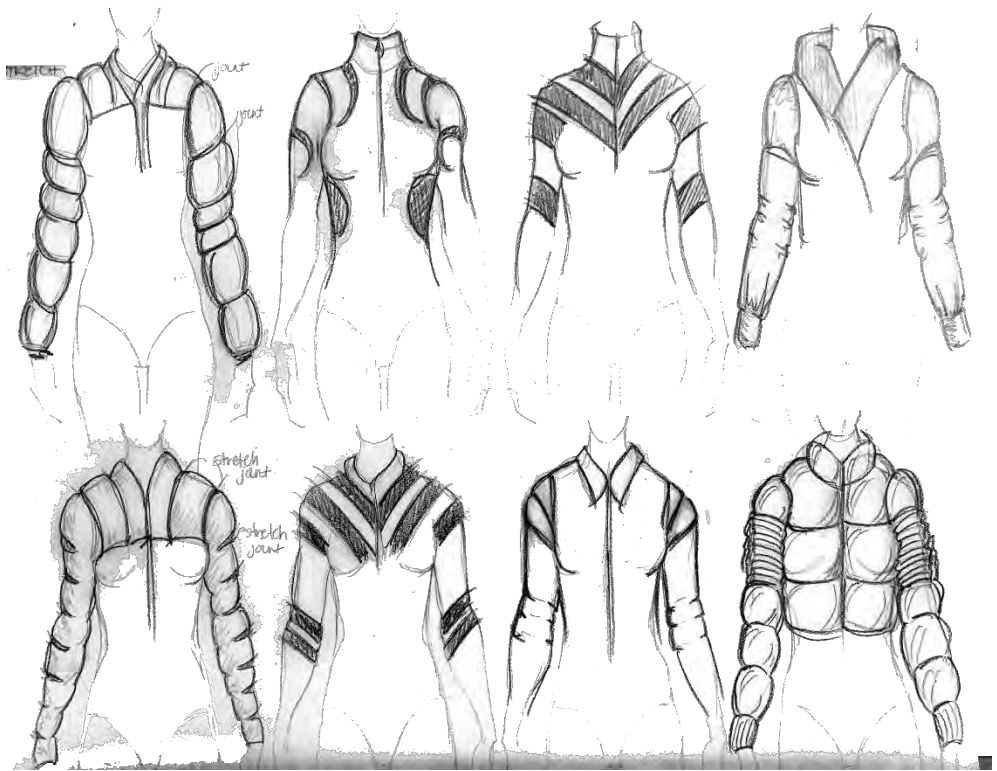


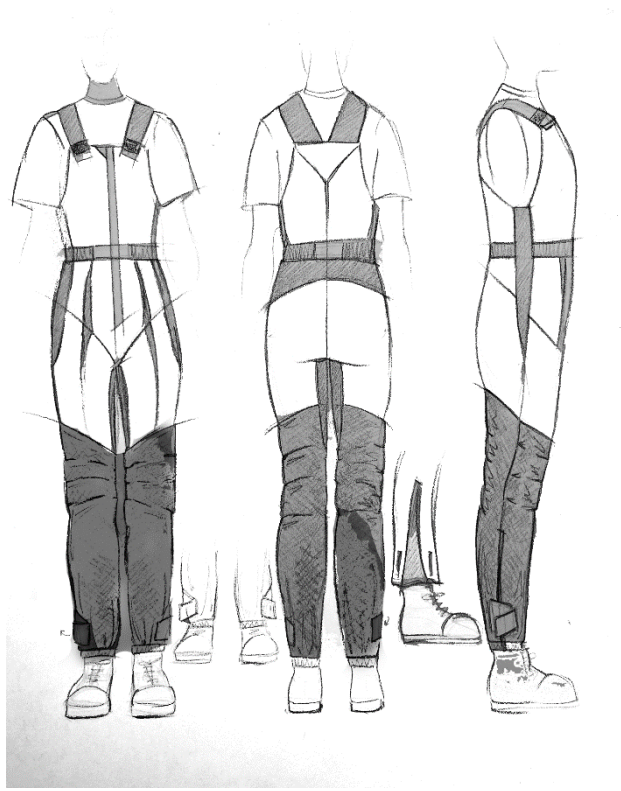
Ideation Process 2: Sketching

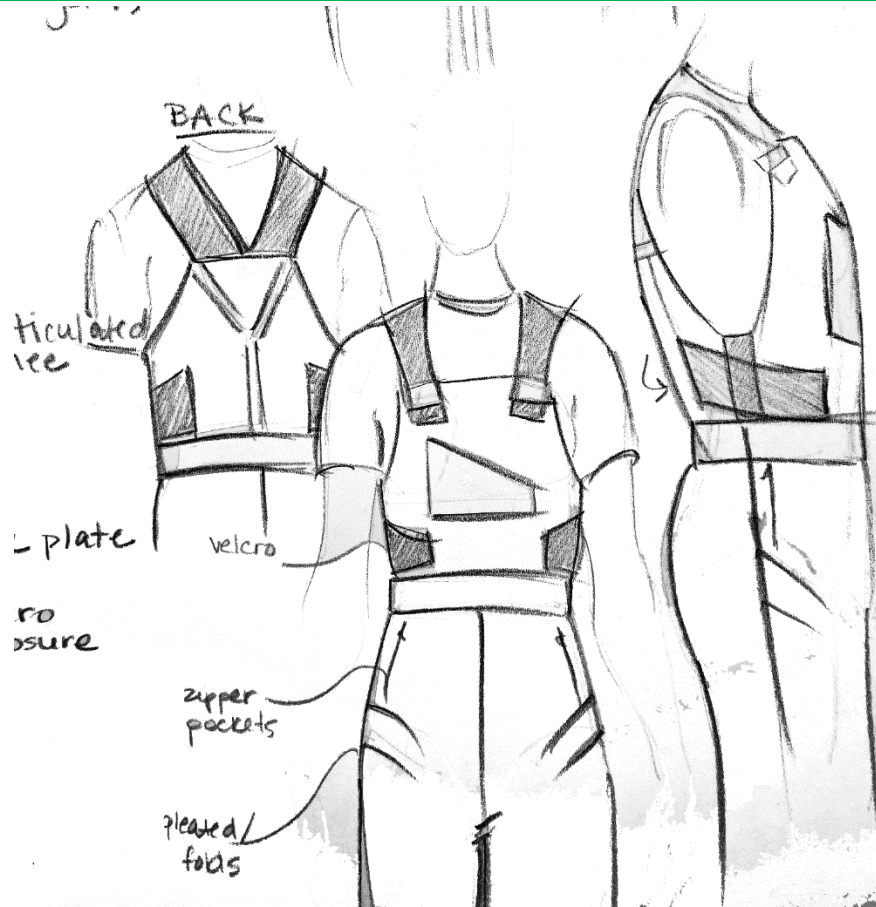
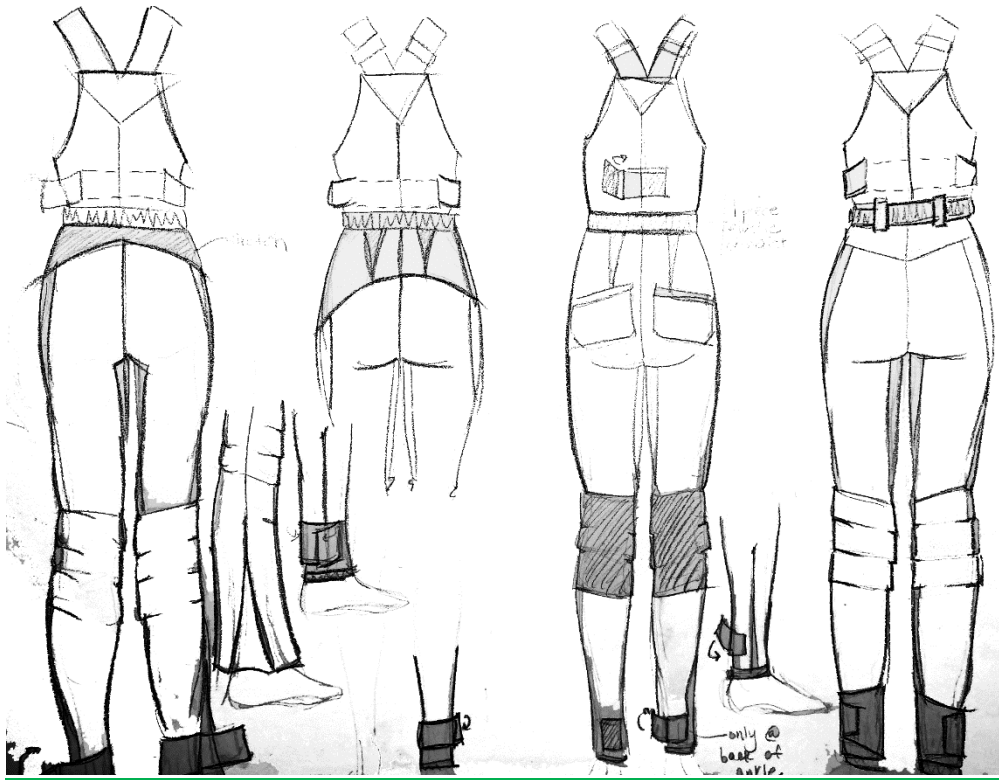
Sketches were created for the shirt, shorts, coveralls and jacket based on mind mapping of each piece. The focus of the sketching switched from all items to focusing on the coveralls and jacket first. These are the items that the NPS Rangers typically replace with their own clothing if they want something more comfortable, better fitting, etc. (Uniform direction does depend on the individual parks and usually exceptions are taken in in more extreme weather cases.)











Ideation process 3: On-Mannequin Draping - (Stretch panels

Following the initial rounds of sketching, example of stretch panels and gussets were made because mobility was determined to be the number one design aspect in the jacket and the pants.





On-Mannequin Draping – Coveralls 1st Prototype

The first round of prototyping for the coveralls was done by draping muslin fabric on the mannequin.





On-Mannequin Draping – Coveralls 2nd Prototype

The second round of prototyping for the coveralls resulted in a base pattern with the intention of creating multiple rounds of pattern pieces until a final design with all details and accessories is met. This ideation process will be carried forward for all pieces to reach a final design decision.







On-Mannequin Draping – Jacket



PART 6 – Validation Plan

Based on findings in Part 4, these are the top design priorities for each item:

Summer Shirt

5. Mobility
6. Thermoregulation
7. Fit / fit across range of sizes
8. Professional appearance

Coveralls / Bibs

5. Mobility
6. Thermoregulation
7. Fit / fit across range of sizes
8. Storage

Summer Shorts

5. Mobility
6. Fit / fit across range of sizes
7. Storage
8. Thermoregulation

Jacket

5. Mobility
6. Thermoregulation
7. Fit / fit across range of sizes
8. Storage

Below is an outline of methods to be used to validating each design priority for each item.

<i>Item*</i>	<i>Design Priority</i>	<i>Baseline testing if applicable</i>	<i>Final Testing and / or data collection</i>
Summer Shirt	Mobility	Baseline poses with current uniform pieces: <ul style="list-style-type: none"> - Rotation at trunk (testing waistband) - Reach up (arms fully extended) - Reach up (arms bent at elbows) Document baseline testing with camera.	Perform baseline poses for final product. With and without pack. Associate each pose with real life activity
	Thermoregulation		Wear testing: go on hike that has similar obstacles as the Grand Canyon (if trip to Grand Canyon is not possible) Get real time athlete feedback. Record findings with journal, camera / pictures and go pro / video.

	Fit / Fit across range of sizes	Determine where adjustable features can be added to the baseline garments. Implement different features into new designs and document feedback and progress pictures.	Document wearer feedback on fit, adjustability and overall comfort of garment during wear testing. Fit final sample to 2 other individuals to determine if the adjustable features are useful to fitting different body types.
	Professional appearance	Send a survey / questionnaire to gather athlete insight. Present several different ideas for the final shirt.	Send a final survey / questionnaire to gather athlete feedback on final design. Present several views of final design; include final sketches.
Summer Shorts	Mobility	Baseline poses with current uniform pieces: <ul style="list-style-type: none"> - Squats (define how far apart feet are.) - Lunges (define how far apart feet are.) - Rotation at trunk (testing waistband) Document baseline testing with camera.	Perform baseline poses for final product. With and without pack. Associate each pose with real life activity
	Fit / fit across range of sizes	Determine where adjustable features can be added to the baseline garments. Implement different features into new designs and document feedback and progress pictures.	Document wearer feedback on fit, adjustability and overall comfort of garment during wear testing. Fit final sample to 2 other individuals to determine if the adjustable features are useful to fitting different body types.
	Storage	Procure items that rangers typically carry based on athlete	Document wearer feedback on mobility and accessibility during wear testing.

		<p>feedback about storage needs.</p> <p>Determine placement of storage based on size / shape of items and mobility / accessibility needs of the ranger.</p>	
	Thermoregulation		<p>Wear testing: go on hike that has similar obstacles as the Grand Canyon (if trip to Grand Canyon is not possible)</p> <p>Get real time athlete feedback.</p> <p>Record findings with journal, camera / pictures and go pro / video.</p>
Coveralls / bibs	Mobility	<p>Baseline poses with current uniform pieces:</p> <ul style="list-style-type: none"> - Squats (define how far apart feet are.) - Lunges (define how far apart feet are.) - Rotation at trunk (testing waistband) - Reach up (arms fully extended) - Reach up (arms bent at elbows) <p>Document baseline testing with camera.</p>	<p>Perform baseline poses for final product.</p> <p>With and without pack.</p> <p>Associate each pose with real life activity</p>
	Thermoregulation		<p>Simulate cold weather conditions.</p> <p>Get real time athlete feedback.</p> <p>Record findings with journal, camera / pictures and go pro / video.</p>

	Fit / Fit across range of sizes	Determine where adjustable features can be added to the baseline garments. Implement different features into new designs and document feedback and progress pictures.	Document wearer feedback on fit, adjustability and overall comfort of garment during wear testing. Fit final sample to 2 other individuals to determine if the adjustable features are useful to fitting different body types.
	Storage	Procure items that rangers typically carry based on athlete feedback about storage needs. Determine placement of storage based on size / shape of items and mobility / accessibility needs of the ranger.	Document wearer feedback on mobility and accessibility during wear testing.
Jacket	Mobility	Baseline poses with current uniform pieces: <ul style="list-style-type: none"> - Rotation at trunk (testing waistband) - Reach up (arms fully extended) - Reach up (arms bent at elbows) Document baseline testing with camera.	Perform baseline poses for final product. With and without pack. Associate each pose with real life activity
	Thermoregulation		Simulate cold weather conditions. Get real time athlete feedback. Document findings with journal, camera / pictures and go pro / video.
	Fit / Fit across range of sizes	Determine where adjustable features can be added to the baseline garments. Implement	Document wearer feedback on fit, adjustability and overall comfort of garment during wear testing.

		different features into new designs and document feedback and progress pictures.	Fit final sample to 2 other individuals to determine if the adjustable features are useful to fitting different body types.
	Storage	<p>Procure items that rangers typically carry based on athlete feedback about storage needs.</p> <p>Determine placement of storage based on size / shape of items and mobility / accessibility needs of the ranger.</p> <p>Document process with progress pictures.</p>	Document wearer feedback on mobility and accessibility during wear testing.

**Make 1 wear test sample for each item where possible.*

PART 7 – Presentation Plans for Spring Term*

The presentation plan is to display the final products and final research as though they are in an NPS museum exhibit. With the help of Nancy Russell (NPS Historical Collection Curator), I will create a layout to include:

- historian research,
- NPS Ranger information and FAQs,
- Search and rescue information and FAQ,
- Grand Canyon Search and rescue statistical display,

Here are a few resources that Nancy Russel has sent for more information:

- NPS Museum Management Program page which has done a bunch of virtual exhibits with NPS museum collections. <https://www.nps.gov/museum/>
- Harpers Ferry Center's info on exhibit development: <https://www.nps.gov/subjects/hfc/museum-and-visitor-center-exhibit-planning-design-and-fabrication.htm>
- A search for parks or NPS on <https://www.google.com/culturalinstitute/about/>

My initial plan for layout and materials include:

Board 1	<ul style="list-style-type: none"> - Who are rangers and what do they do? FAQs about rangers - History of the NPS parks women’s uniforms. A more formal and longer timeline that Winter 2020 semester. - Information specific to Grand Canyon and Grand Canyon search and rescue efforts - Interview snippets from rangers
Board 2	<ul style="list-style-type: none"> - My research - Athlete insights and feedback on my process, ideation and revisions.
Board 3	<ul style="list-style-type: none"> - Wear testing and final designs
Table	<ul style="list-style-type: none"> - NPS uniform catalogs - Baseline garments used for wear testing
Mannequin 1	<ul style="list-style-type: none"> - Final summer shirt and cargo shorts
Mannequin 2	<ul style="list-style-type: none"> - Final winter coverall bibs and jacket

When my final presentation and final exhibit pieces are completed I plan to send them to Nancy Russel to see if there would be any interest in displaying them at a NPS Museum, When speaking to hear about her own uniform exhibits, it seems to take a very long time to get any kind of exhibit approved. She may have other avenues of display that could work for an NPS specific topic.

*Part 8 was created before the Covid 19 stay at home order was in effect.

PART 8 – Spring Term Work Plan*

Spring Term Work Plan

MARCH 2020

<i>Week of March 22</i>	<i>Week of March 29</i>
<ul style="list-style-type: none"> - Prototyping / finalize patterns for winter bibs - Finalize materials for winter bibs and winter jacket - Fit testing for shirt and shorts 	<ul style="list-style-type: none"> - Prototyping / finalize patterns for winter jacket - Prototyping summer shirt

APRIL 2020

<i>Week of April 5</i>	<i>Week of April 12</i>
<ul style="list-style-type: none"> - Prototyping summer shorts - Following the pattern from bib pants 	<ul style="list-style-type: none"> - Buffer week
<i>Week of April 19</i>	<i>Week of April 26</i>
<ul style="list-style-type: none"> - Field testing for winter bibs and winter jacket - Collect final data including athlete insights, material behavior and fit feedback - Send final designs to NPS park ranger contacts to get feedback on designs 	<ul style="list-style-type: none"> - Field testing of shirt and cargo shorts - Collect final data including athlete insights, material behavior and fit feedback - Send final designs to NPS park ranger contacts to get feedback on designs

MAY 2020

<i>Week of May 3</i>	<i>Week of May 10</i>
<ul style="list-style-type: none"> - Complete final prototypes of winter bibs, jacket, shorts and shirt - Take final photos - Final sketches 	<ul style="list-style-type: none"> - Confirm final layout for display - Purchase all materials for final display
<i>Week of May 17</i>	<i>Week of May 24</i>
<ul style="list-style-type: none"> - Buffer week 	<ul style="list-style-type: none"> - Complete final display set up for finals week

*Part 8 was created before the Covid 19 stay at home order was in effect.

PART 9 – Spring Term Outcomes

The Spring 2020 semester took place during the stay at home order due to Covid 19.

Final Problem Statement

Outfitting the National Park Service female rangers has been a rough and often times controversial path. Early on, the women in the service would wear a make shift uniform, often times utilizing their husbands' hunting clothing or the men's uniform. Today, women's cut clothing is provided but is very similar to the men's uniform and inadequately addresses the unique body shape of the female rangers.

Final Proof of Concept Statement

Each piece in the TRAILBLAZER RANGER COLLECTION is designed specific to the needs of the U.S. National Park Service female rangers. Female-specific fit, body contouring stretch panels and waterproof and breathable materials are all used strategically to provide the most comfort without compromising movement, function, professional appearance and the historical color scheme that is synonymous with the U.S. National Park Rangers.

Validations Plan

PERCEPTION TEST



Andrea Willingham
Former US National Park Ranger

FIT, FEEL, PERFORMANCE EXPERIENCE



Carly Anderson
Fit Model

EXPERT INTERVIEW



Charity Fox
Senior Technical Designer - Outerwear
Outdoor Research

EXPERT INTERVIEW



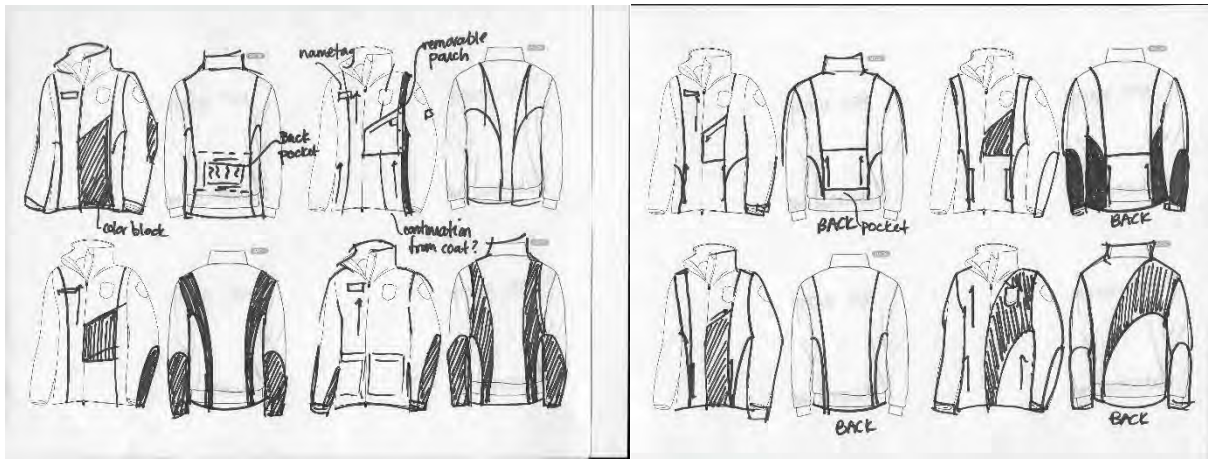
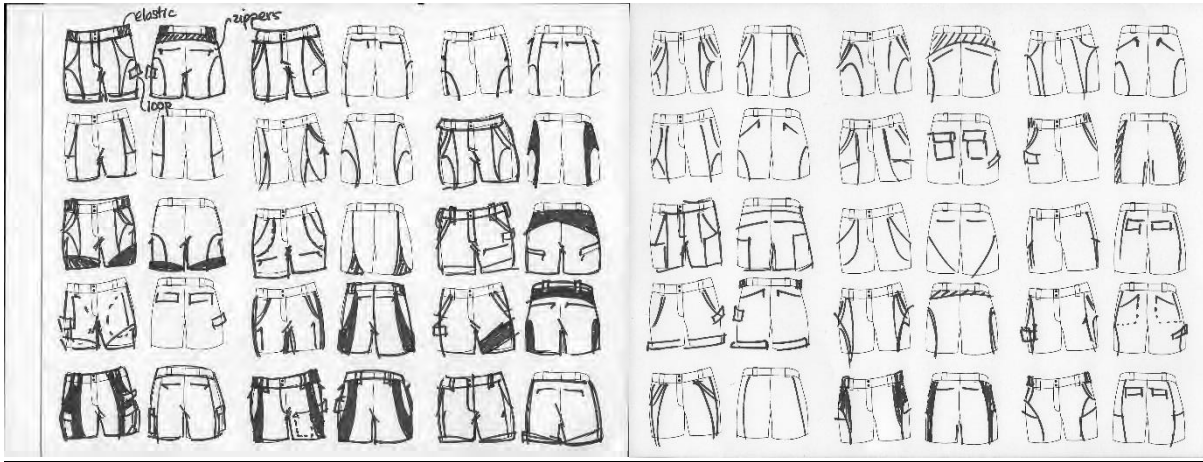
Nancy Russell
Archivist - NPS History Collection
National Park Service

Design Validation Test with Andrea Willingham, former NPS Ranger dated April 18, 2020

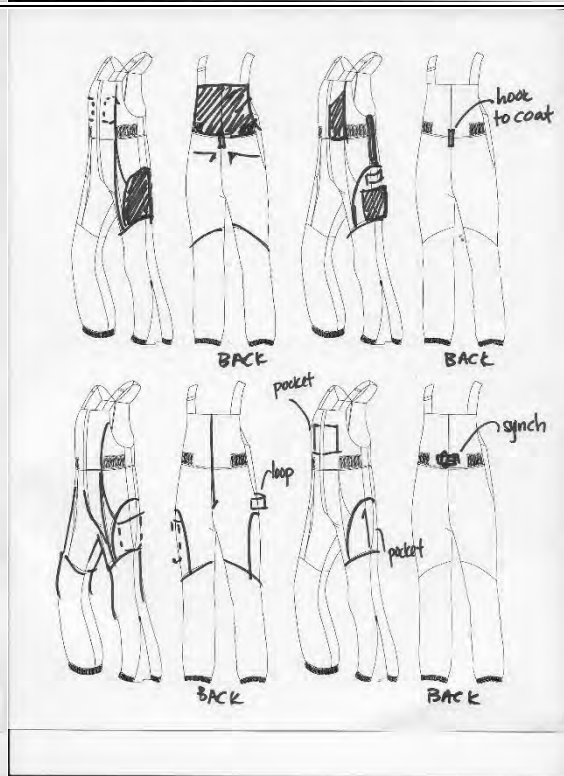
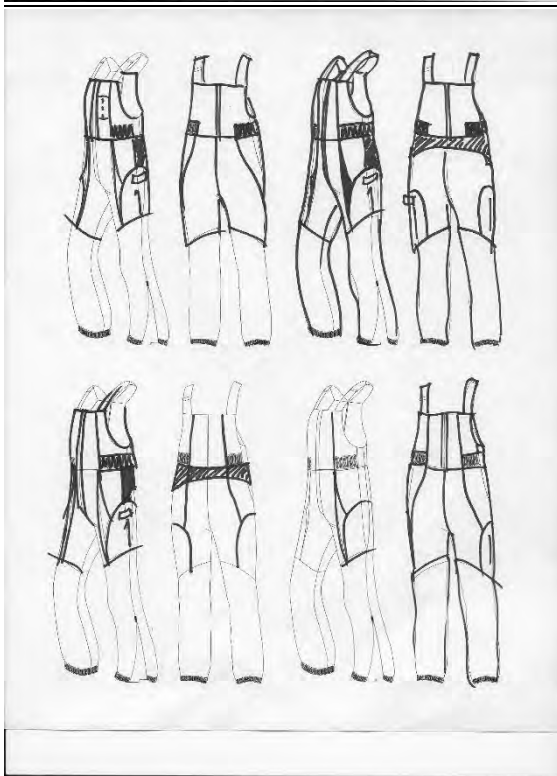
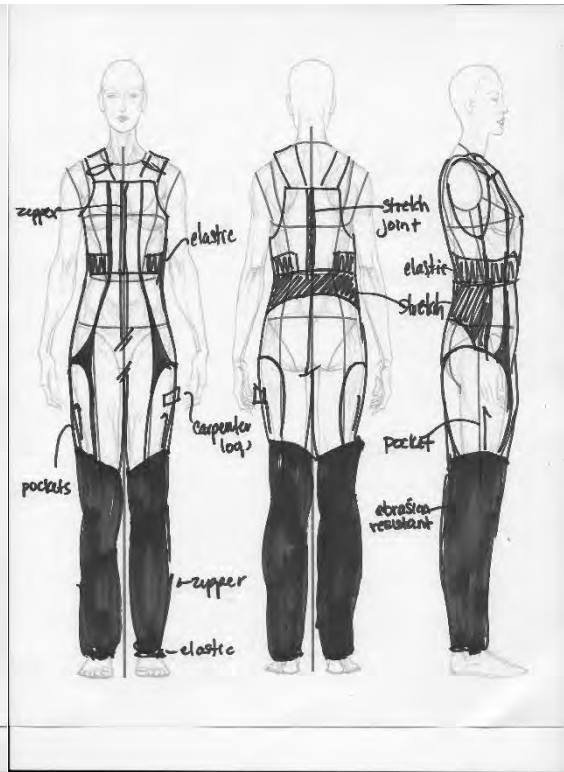
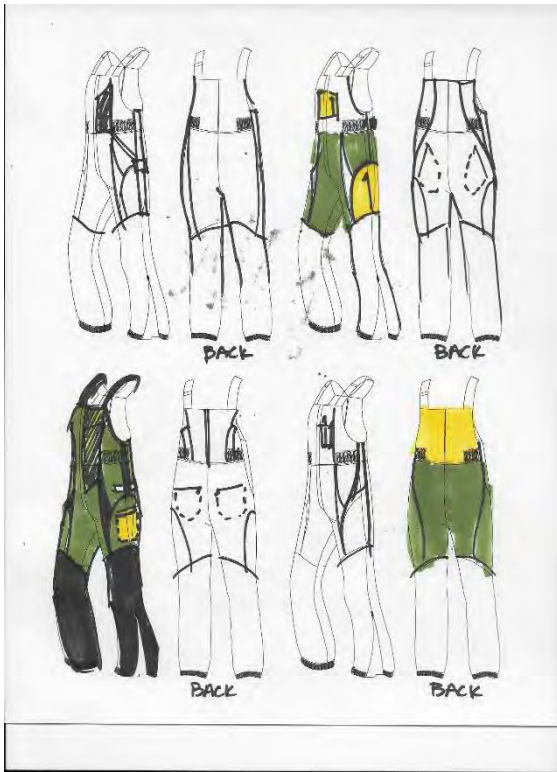
“I really like where you’re going with this. I think it’s a great improvement. I think its both modernizing it but its also keeping it true to the aesthetic that most people know.” – Andrea Willingham

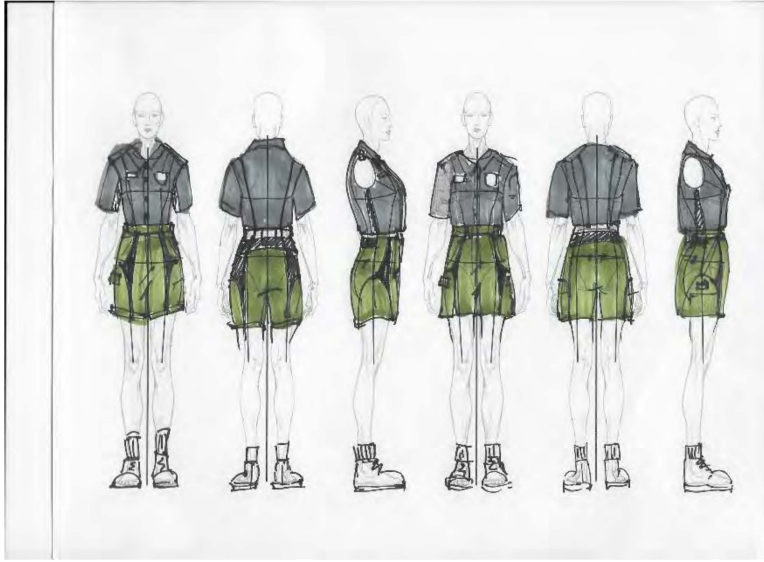
HIKING OVERALLS / CARGO SHORTS	WORKSHIRT	RAIN JACKET
<p>Likes</p> <ul style="list-style-type: none"> - Stretch panel on the back yoke. Good that it moves with you - Stretch panels at thighs - cool shapes - looks very practical - Overall perception: sleek sporty look - Water resistant pants! Much needed for trekking. - Long zipper down the front; easy on/off, don’t have to fight with it - All the adjustable parts make sense <p>Comments</p> <ul style="list-style-type: none"> - Additional pockets / cargo pockets on legs - Loops for carabiner - Secure storage - zippers, snaps, Velcro 	<p>Likes</p> <ul style="list-style-type: none"> - Breathable material - No permanent name tags; can keep getting passed down in the storage - Color is very important - faux front placket - Mesh / moisture wicking materials at the collar <p>Comments</p> <ul style="list-style-type: none"> - Front, chest pockets are never really used; occasionally used to hold pens depending on where you are working - Law enforcement rangers may use the pockets to keep their notepad but not all types of rangers would need them 	<p>Likes</p> <ul style="list-style-type: none"> - Badge and nametag holder/ additional fabric (2 holes) - High-low hem - Materials of the jacket - fleece lined in the body and neck - Removable hood; would only need to fit over ball cap (in the back country) - Medium weight. Current jackets are a too heavy parka or a soft shell that is meant to go over a sweater. It would be nice to have a jacket that you can layer or wear over uniform shirt. <p>Comments</p> <ul style="list-style-type: none"> - Very sleek looking

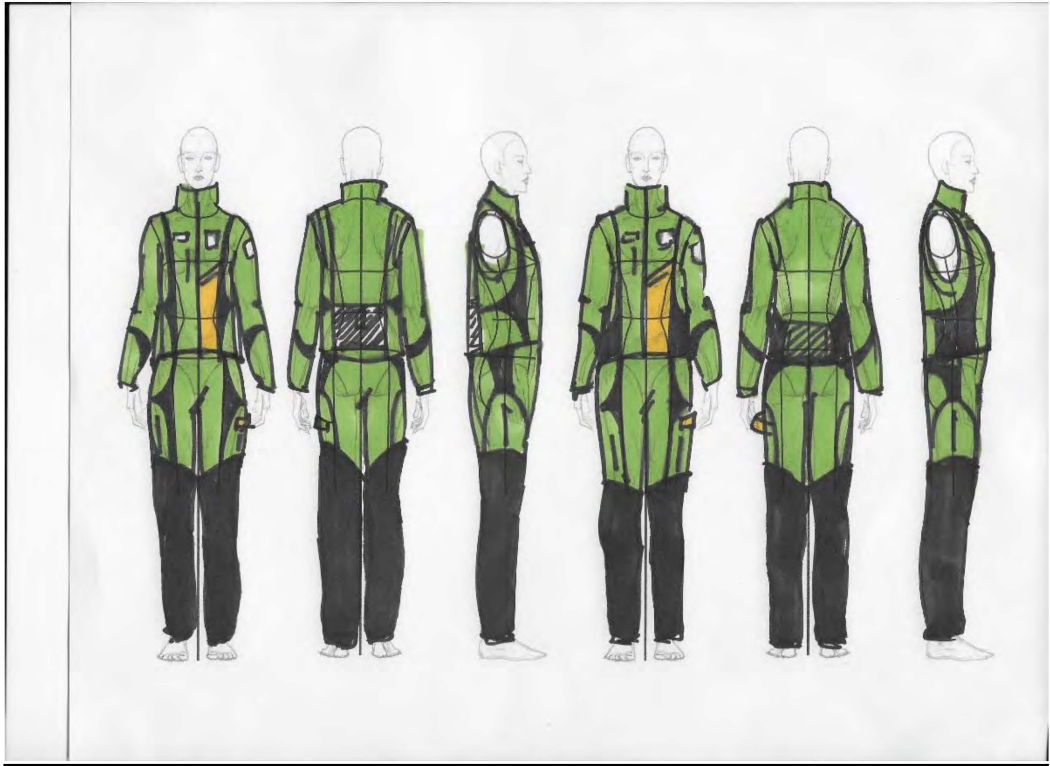
Spring Term Sketching

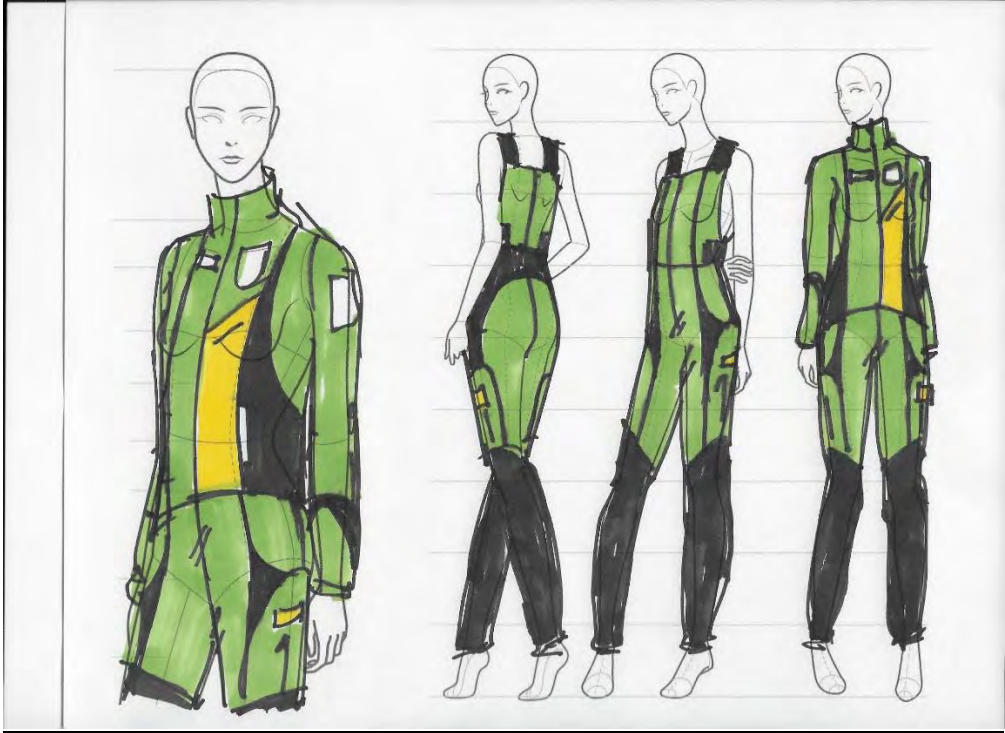












Ideation: Prototyping and Fit Testing

Work Shirt







Rain Jacket







Cargo Shorts

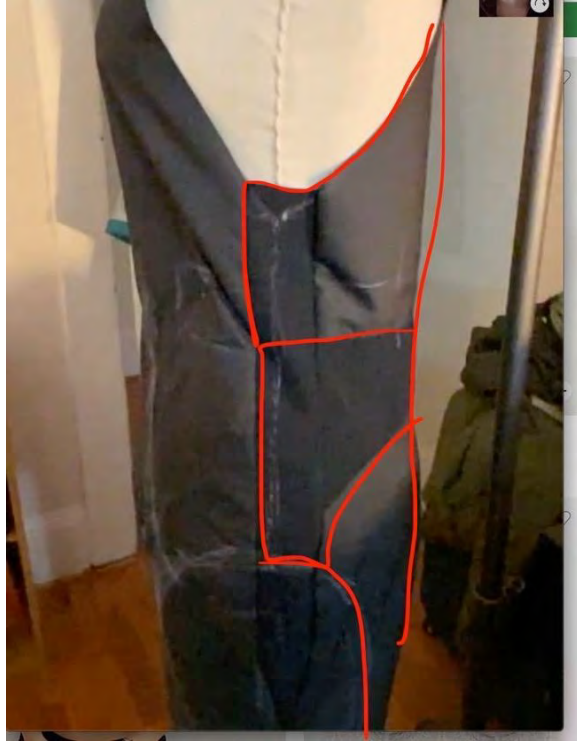


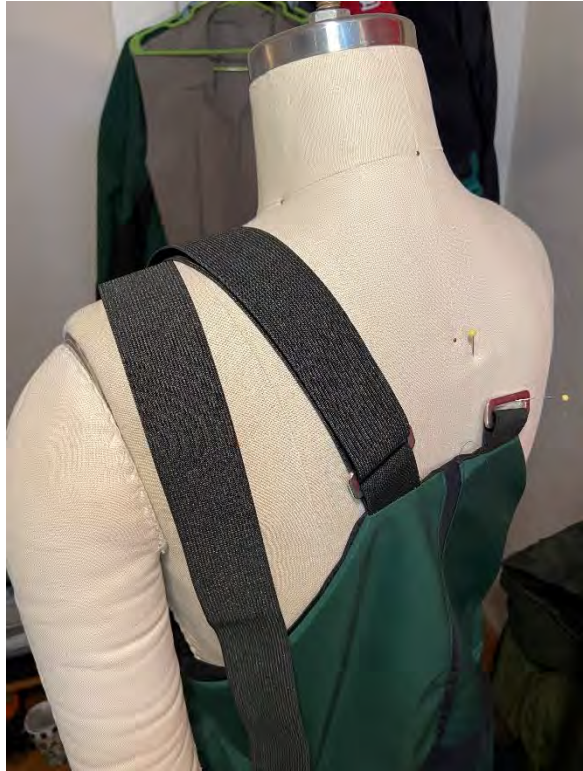




Overalls







Final Product Shots

Work Shirt



Jacket



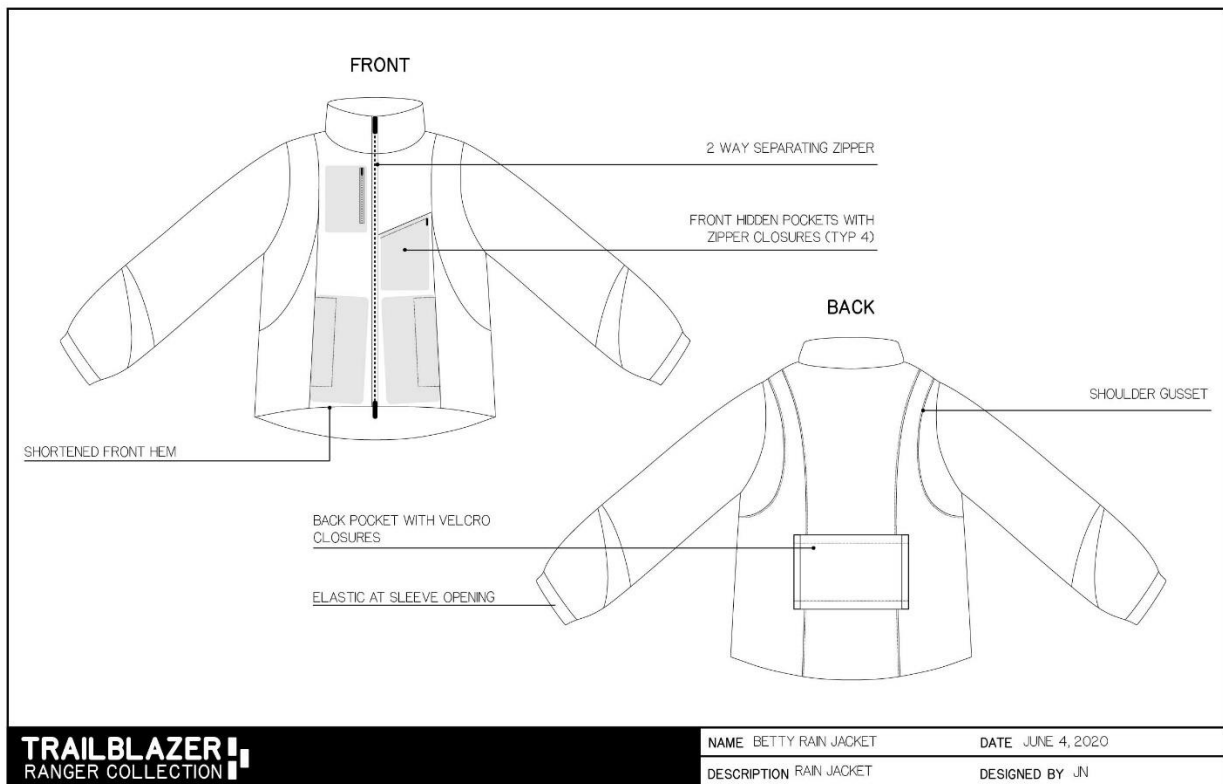
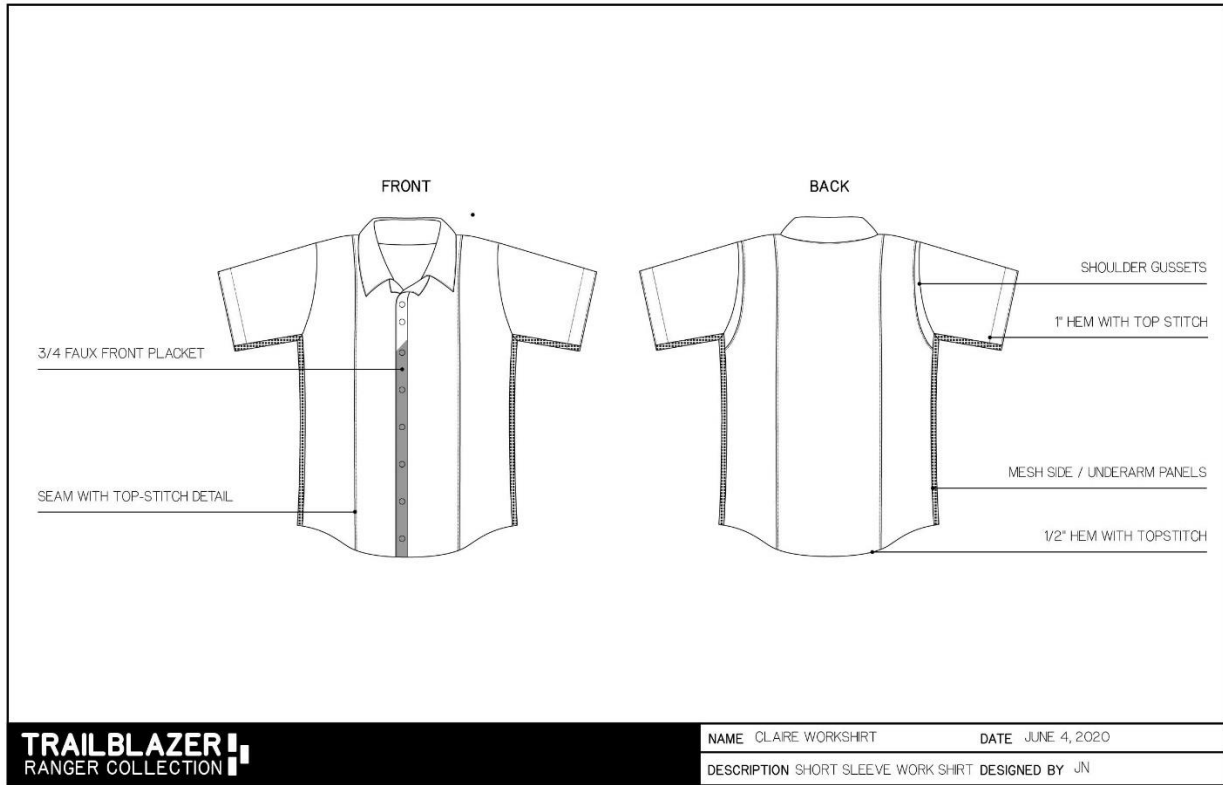
Shorts

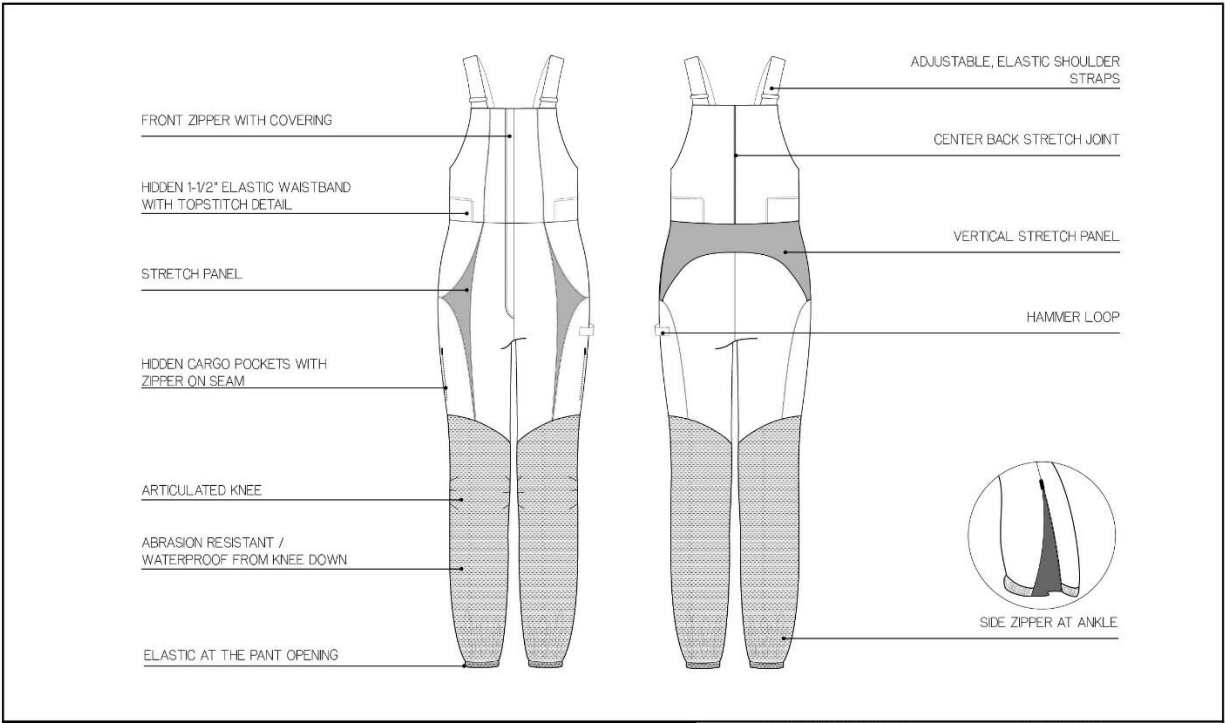


Overalls



Tech Drawings





TRAILBLAZER RANGER COLLECTION	NAME POLLY HIKING OVERALLS	DATE JUNE 4, 2020
	DESCRIPTION SUMMER HIKING OVERALLS	DESIGNED BY JN



TRAILBLAZER RANGER COLLECTION	NAME FRAN CARGO SHORTS	DATE JUNE 4, 2020
	DESCRIPTION SUMMER CARGO SHORTS	DESIGNED BY JN

Features & Benefits

FRONT ZIPPER
Front zipper allows for easy on-off

ELASTIC WAIST
Elastic panels continuing from front to back create a fitted waist without too-tight, pinching.

4 WAY STRETCH PANELS
Body contouring panels that move and stretch naturally with the female figure.

ARTICULATED KNEE
Additional fabric at knee to allow for easy movement

ANKLE ZIPPERS
Easy on-off with ankle zippers, fitted at the bottom and can be worn over boots

ELASTIC SHOULDER STRAPS
Adjustable, elastic straps that moves with the body

HORIZONTAL STRETCH
Stretch joint allows for additional movement and comfort across back

VERTICAL STRETCH
Stretch panel at back yoke gives additional stretch when bending and sitting

CARPENTER LOOPS
Loops for clip-on storage.

ABRASION RESISTANT MATERIAL
Knee-down waterproof, abrasion resistant material providing protection for trekking through the backcountry.

TRAILBLAZER RANGER COLLECTION	NAME POLLY OVERALLS / FRAN SHORTS	DATE JUNE 4, 2020
	DESCRIPTION PARTS AND PURPOSE	DESIGNED BY JN

STORAGE
Multiple zippered pocket options to keep phone, keys, note cards, emergency items, etc. secure

HIGH-LOW DESIGN
High - low hem provides less restricted movement in front

SHOULDER GUSSETS
Gussets at shoulder give extra room for less restricted movement

BACK POCKET
Easy access storage for larger items such as notepads, flashlight or emergency items

MOISTURE WICKING
Moisture wicking material at interior of collar keeps back of neck dry and cool

3/4 FAUX FRONT PLACKET
Faux placket provides a classic professional look without the common issues of buttons popping open, gaps and odd stretching. The top two buttons remain functional.

DOUBLE LAYER MESH
Double layer of mesh at sides and underarms stretches and allows airflow to keep cool

TRAILBLAZER RANGER COLLECTION	NAME BETTY JACKET/CLAIRE SHIRT	DATE JUNE 4, 2020
	DESCRIPTION PARTS AND PURPOSE	DESIGNED BY JN

Branding

Trailblazer Logo

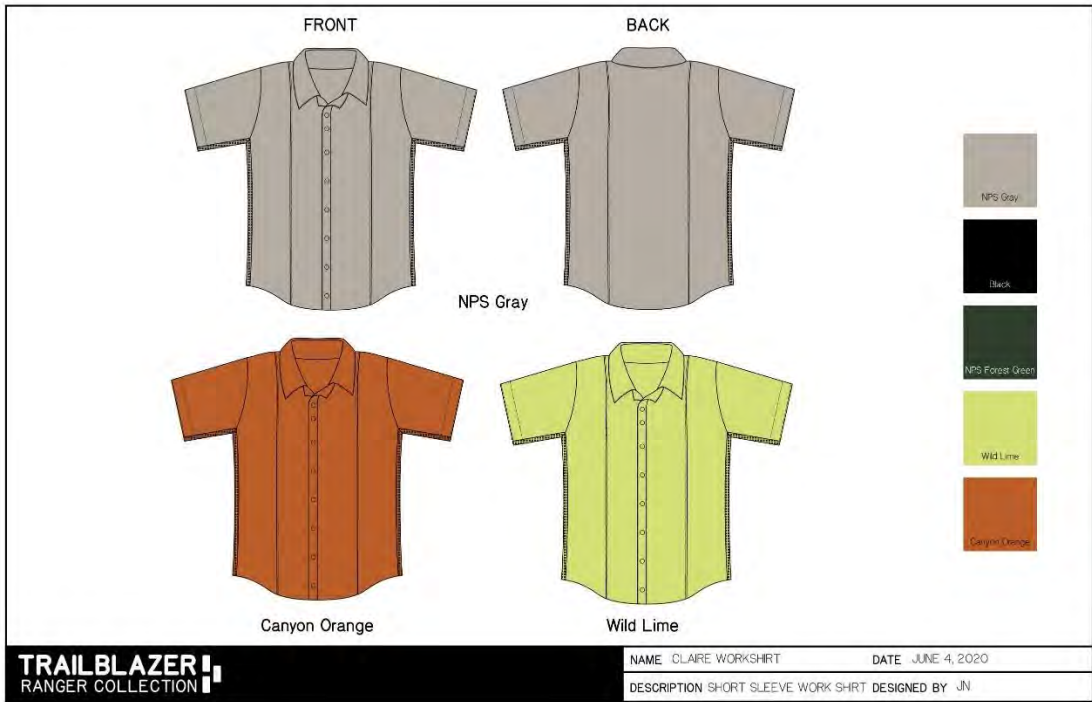
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	<table border="1"><tr><td>NAME</td><td>TRAILBLAZER COLLECTION</td><td>DATE</td><td>JUNE 4, 2020</td></tr><tr><td>DESCRIPTION</td><td>FONTS AND LOGOS</td><td>DESIGNED BY</td><td>JN</td></tr></table>	NAME	TRAILBLAZER COLLECTION	DATE	JUNE 4, 2020	DESCRIPTION	FONTS AND LOGOS	DESIGNED BY	JN
NAME	TRAILBLAZER COLLECTION	DATE	JUNE 4, 2020						
DESCRIPTION	FONTS AND LOGOS	DESIGNED BY	JN						



Available Color Ways

Because the colors of the National Park Service rangers are iconic, the cargo shorts, rain jacket and overalls will be available in the traditional NPS green. Additionally, the work shirt will be available in the NPS gray.





Logos and Labels

It is important to note that The National Park Service cannot endorse any one brand so each of the NPS colorway options will be available for purchase with all of the exterior logo removed.

INTERIOR / COLLAR TAGS

TRAILBLAZER
RANGER COLLECTION

INSPIRED BY
SERVICE

S

10% MATERIALS
70% MATERIALS
20% MATERIALS

CARE
INSTRUCTIONS

MADE IN THE USA

BUTTONS / SNAPS

EXTERIOR POCKET TAGS

TRAILBLAZER
RANGER COLLECTION

TRAILBLAZER
RANGER COLLECTION

TRAILBLAZER

TRAILBLAZER
RANGER COLLECTION

NAME	TRAILBLAZER COLLECTION	DATE	JUNE 4, 2020
DESCRIPTION LABELS		DESIGNED BY	JN

Trailblazer Tags

Each piece in the collection is named after an influential female ranger throughout the history of the National Park Service, so each item will be accompanied by a tag with their picture and significant contribution or historical relevance.

Front	Back			Fold Example

TRAILBLAZER RANGER COLLECTION	NAME TRAILBLAZER COLLECTION	DATE JUNE 4, 2020
	DESCRIPTION RANGER INFO TAGS	DESIGNED BY JN

TRAILBLAZER RANGER COLLECTION		NAME TRAILBLAZER COLLECTION	DATE JUNE 4, 2020
		DESCRIPTION TAGS - FULL BOOK	DESIGNED BY JN

Athlete Outcomes

The TRAILBLAZER Ranger Collection balances history and innovation. Each piece in the collection honors the legacy of the US National Park Service while taking advantage of newer technologies and functional design. The collection provides a solution unique to the daily responsibilities of the female NPS rangers.

Website Example Page

Instead of traditional uniform catalogs, either print or online, the collection will be available online in a style similar to other outdoor brands. And again, each piece will be accompanied by a feature article of their ranger namesake.

The screenshot shows a product page for the TRAILBLAZER Betty Rain Jacket. The page features a main image of a woman wearing the jacket and shorts, a vertical gallery of five smaller images showing different views of the jacket, and a product information panel on the right. The panel includes the product name, color options with corresponding color swatches, size selection buttons (XXS, XS, S, M, L, XL, XXL), a quantity selector set to 1, and an 'ADD TO CART' button. Below the product information is a 'TRAILBLAZER TALE' section featuring a photo of Betty Reid Soskin and a 'LEARN MORE' link. The TRAILBLAZER logo is in the top left, and the text 'WEBSITE: EXAMPLE PAGE' is in the top right.


TRAILBLAZER WEBSITE: EXAMPLE PAGE

RANGER COLLECTION:
BETTY RAIN JACKET

COLOR:
NPS GREEN / BLACK / WILD LIME BLACK / WILD LIME NPS GREEN

SIZE: [SIZE CHART](#)
XXS XS S M L XL XXL

QUANTITY: 1 **ADD TO CART**

TRAILBLAZER TALE:

BETTY REID SOSKIN
[LEARN MORE](#)

Final Thoughts / Feedback from Andrea Willingham and Nancy Russell

Claire Workshirt

- Nancy Russell
 - “I really like the gussets. They would make a big difference if you’re out in the field and you’re reaching and bending and lifting.”
 - “Very reminiscent 1962 uniform shirt...”
 - “...designed more for a women’s body than the current shirt.”
- Andrea Willingham
 - “I like how you really kept the style of the shirt intact but then made some changes.”

Fran Cargo Shorts

- Andrea Willingham
 - “The style is such an improvement over the shorts that they have. I like that they are high waisted so it can be flattering to many different body types.”

Betty Rain Jacket

- Nancy Russell
 - “for field work it’s nice to have zippers...so you don’t get back to the car and wonder where your car keys are.”
- Andrea Willingham
 - “I like [the back pocket] because you could put something bigger like a notepad or a radio - something that would be bulky that you wouldn’t want right in front of you where it would hit your arm.”

Polly Hiking Overalls

- Andrea Willingham
 - “The style is so cute and functional. I’d super wear the heck out of that.”

Other / General Comments

- Nancy Russell
 - “I like the fact that the exterior labels are removable ... the value of your pieces is that you can make them your own.”
- Andrea Willingham
 - think that you really incorporated the feedback you’ve gotten from everyone you’ve talked to in terms of keeping it close to the spirit of the uniform and then also bringing some modern influence to it because it is this balance carrying on the legacy of it but also taking advantage of newer technologies and newer designs that are actually more functional for the kinds of work that park rangers have to do every day.

Future Improvements

Polly Hiking Overalls	Fran Cargo Shorts	Betty Rain Jacket	Claire Workshirt
Add front pockets for hands / storage	Add belt loops to the prototype	Make pocket on back of jacket bigger and secure with light zippers	Shorten sleeves slightly
Adjust length of front zipper or add separate system for ease of removing overalls in the backcountry	Try cargo pocket options with lighter / smaller zippers	Add removable hood or hidden hood	Make shoulder slightly narrower; mobility can be achieved with the shoulder gussets
Try cargo pocket options with lighter / smaller zippers	Add gusset at crotch of garment	Add option for badge and nametag hook specific to the NPS colorways	Add option for badge and nametag hook specific to the NPS colorways
Add gusset at crotch of garment	2 nd round of prototyping with better fabrics	2 nd round of prototyping with better fabrics	2 nd round of prototyping with better fabrics
2 nd round of prototyping with better fabrics			

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APPENDIX A

Historical Uniforms Photos # 1 – 29

2019 New Uniform Photos # 30 – 50

1



2



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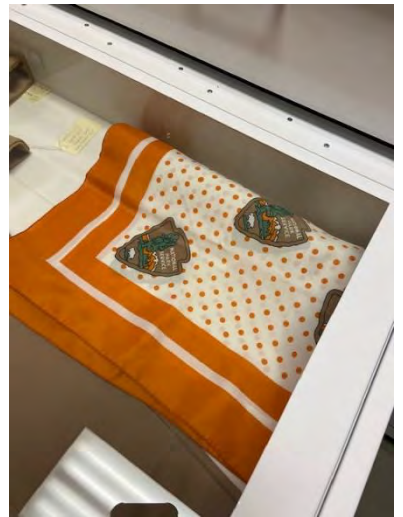
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Winter Term Homework 1
Project and Research Inventory
Dated 1-8-2020



The the first female park ranger was hired in 1918, two years after the National Park Service was founded. Early on, the women in the service would wear make shift uniforms, often times utilizing their husbands' hunting clothing or the men's uniform. Today, women's cut clothing is provided but is very similar the men's uniform and inadequately addresses the unique body shape of the women rangers.

My thesis project will focus on redesigning the NPS ranger uniforms. Specifically female, law enforcement rangers employed at the Grand Canyon National Park.

History of the Women's NPS Uniform



1918

First female ranger is hired. Most females wore their husbands hunting clothes or "camping clothes"



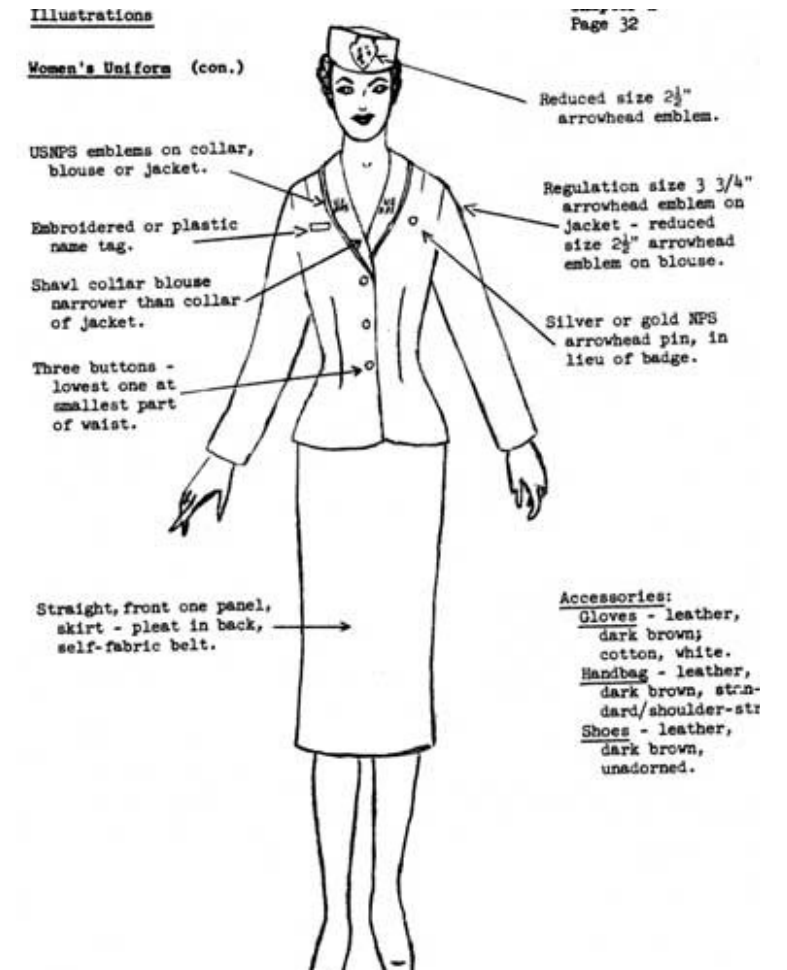
1941

Attack on Pearl Harbor calls men to war; women step in to fill all NPS roles. Unofficial material-saving (non-wool) uniform is created for women.



1947

First uniform regulations pertaining specifically to women was issued.



1959-1961

New "Stewardess" style womens uniform is distributed. (Not well received).

History of the Women's NPS Uniform



1970

Pants are introduced to the women's uniform. Later that year entirely new uniforms were introduced. They did not last long.



1974

"McDonald's" uniform. Included a pantsuit option.



1978

Women are allowed to wear the same "gray and green" uniform as men. One year later, due to lack of progress, a class action lawsuit is filed.



1980

One uniform supplier is contracted to furnish both men's and women's uniforms. Extended and special sizes are available.

Environmental Factors - Grand Canyon



Extreme Temperatures:

Hot, mostly dry weather in May and September; extremely hot, dry weather in June; and hot with monsoon thunderstorms in July and August.

Temperature Differences:

Visitors frequently underestimate the temperature and difference in temperature from top of the rim to the bottom of the canyon.



Busy:

The Grand Canyon was the 2nd most visited park in 2018 with 6,380,495 visitors.

Big:

The Grand Canyon is a mile deep, 277 miles long and 18 miles wide. While the park does not include the entire canyon, it measures 1,904 square miles in total.

Job Performance & Risks



User Data:

There are approximately 20,000 park rangers in the NPS workforce, less than 40% are female.



Law Enforcement / Protection:

The role of protection includes: law enforcement, fire-fighting, public safety, visitor management, campground management, search and rescue and emergency medical services.



Physiological & Biomechanical:

Walking, running, horse riding, standing for long periods, hiking, lifting heavy objects, climbing, water or air rescues, carrying heavy loads, extreme temperature changes, self defense maneuvers



Hazards:

Remoteness, response time to emergencies, criminals, weather, rugged terrain, size of the park and wildlife are all potential hazards for rangers.

Research to be done



Athlete insights:

Connect with and interview current and past female park rangers.



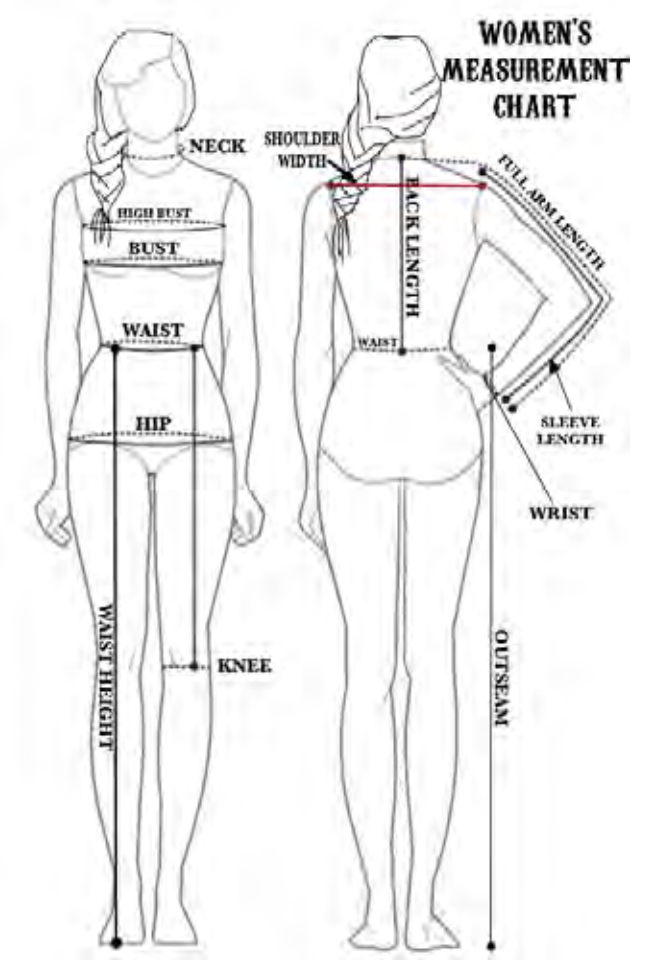
Materials Research:

Current materials use and performance verses proposed materials and performance.



Wear Testing / Field Testing:

What is the life cycle of the material, what are the features and benefits of each material.



Fit Testing:

Fitting for non-traditional sizes and determining comfort parameters.

Execution of research



Interviews / Athlete Insights: Email, phone interviews, in person when possible, create online surveys, books and blogs



Fitting: Define base line to improve from. Look at pros and cons of current (non-uniform) hiking clothing.



Materials Research: Research pros and cons of current and potential future materials for final prototypes.



Field Testing: Create prototypes to be tested in the field. Get real time athlete feedback.

Travel Plan / Field Research



April or early May 2020
Grand Canyon National Park

Make contact with female rangers who are currently working at the Grand Canyon. Create prototypes and conduct in-field wear testing and get real time athlete feed back.



January 13-15th, 2020
Harpers Ferry National Historical Park / Uniform Collection
West Virginia / Washington DC

Meet with Nancy Russell, NPS Uniform Collection Curator, and Ramie Lynch, Uniform Project Manager, to discuss the history of the womens uniform and what are the current standards of the womens specific fit.

Travel Plan / Field Research



Multiple dates
Outdoor Research
Seattle, WA

Meet with my mentor, Charity Fox, Senior Technical Design - Outwear at Outdoor Reserach, to see past military projects she has worked on and determine how what my fitting and final measurements / patterns will need to be successful.



(Optional) Late February
VF Imagewear; Current Manufacturer of NPS Uniform
Nashville, TN

Meet with manager to see currently manufacturing process and determine cost breakdown of different processes if possible.

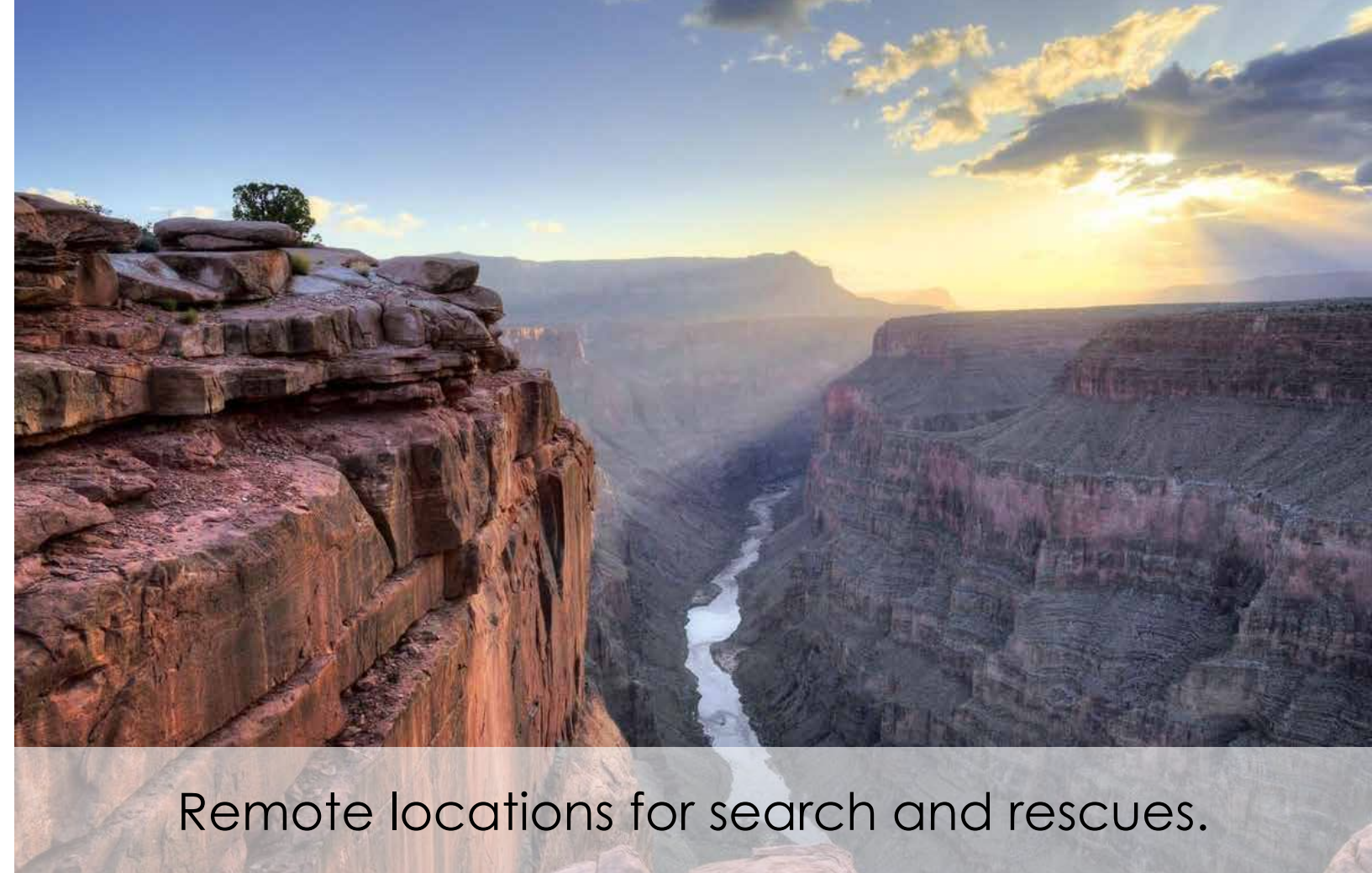
Winter Term Homework 5
Dated 1-27-2020



Exploration of female specific fit and functional design for the Grand Canyon National Park Service Ranger uniforms.



Extreme temperatures. High number of rescues.



Remote locations for search and rescues.



Lack of uniform innovation and options.



Womens specific fit.





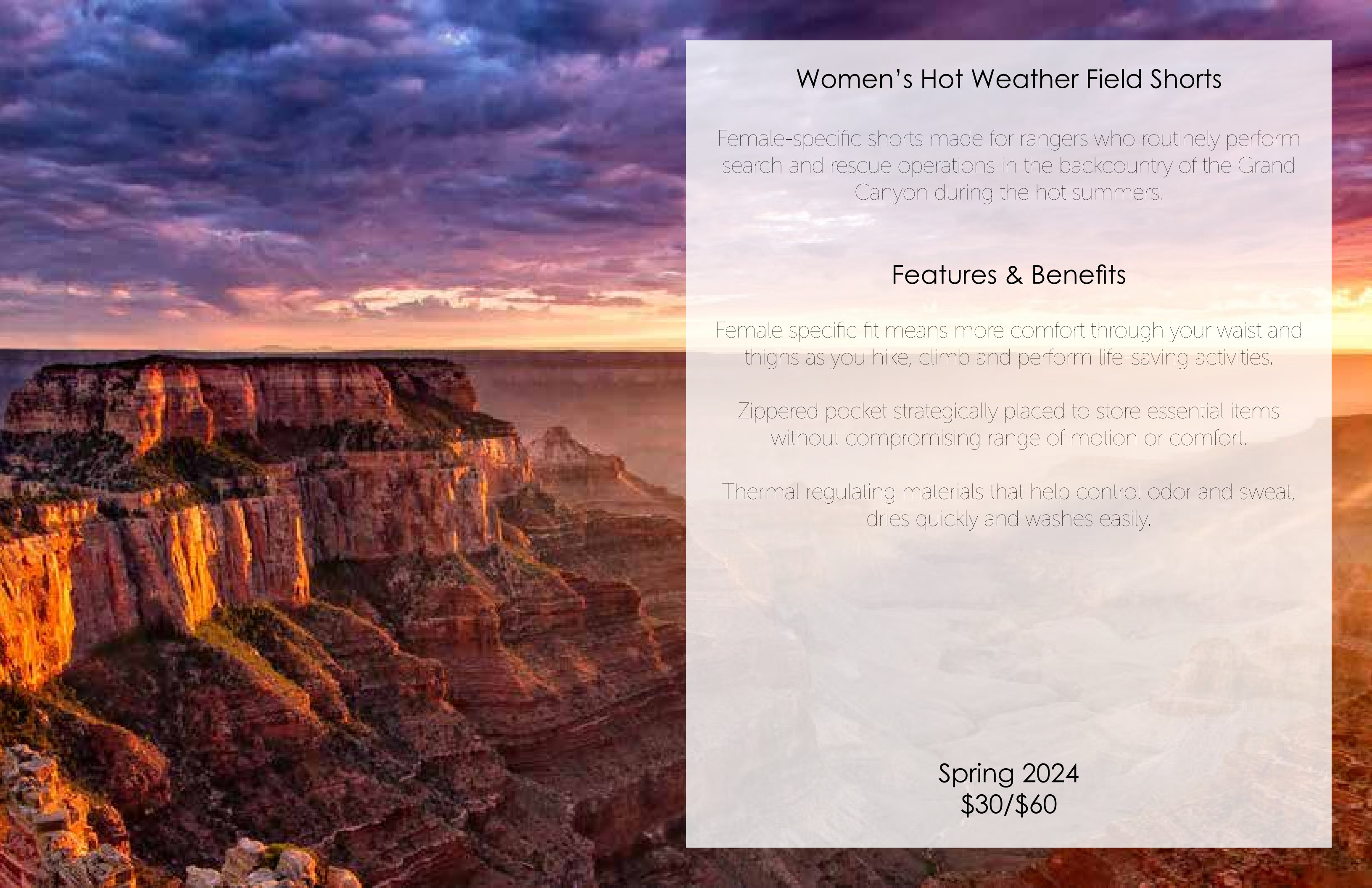
ONE WOMAN'S QUEST TO IMPROVE OUTDOOR APPAREL FOR ALL WOMEN

AUTHOR: HILARY OLIVER

JULY 20, 2015



Charity Fox
Senior Technical Designer - Outerwear



Women's Hot Weather Field Shorts

Female-specific shorts made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the hot summers.

Features & Benefits

Female specific fit means more comfort through your waist and thighs as you hike, climb and perform life-saving activities.

Zippered pocket strategically placed to store essential items without compromising range of motion or comfort.

Thermal regulating materials that help control odor and sweat, dries quickly and washes easily.

Spring 2024
\$30/\$60

Women's Hot Weather Field Shirt

Female-specific field shirt made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the hot summers.

Features & Benefits

Female specific fit means more comfort through the chest and arms, so you spend less time adjusting your clothing as you hike, climb and perform life-saving activities.

Thermal regulating materials that help control odor and sweat, dries quickly and washes easily.

Spring 2024
\$25/\$50



Women's Cold Weather Field Jacket

Female-specific field jacket made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the frigid winters.

Features & Benefits

Female specific fit means more comfort through the chest and arms, so you spend less time adjusting your clothing as you hike, climb and perform life-saving activities.

Professional and unified appearance of the jacket ensures you are recognizable as a NPS ranger.

Breathable insulation that keeps you warm and dry.

Multiple zippered pockets for essential items and a place to keep your phone and radio easily accessible.

Winter 2024
\$75/\$150

Women's Cold Weather Pants

Female-specific fit cold weather pants made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the frigid winters.

Features & Benefits

Female specific fit means more comfort through your waist and thighs as you hike, climb and perform life-saving activities.

Zippered pocket strategically placed to store essential items without compromising range of motion or comfort.

Breathable insulation that keeps you warm and dry.

Winter 2024
\$60/\$120

Week of
February 9 - 15

Week of
February 16 - 22

Week of
February 23 - 29

Week of
March 1 - 7

Week of
March 8 - 14

Tasks

Ideation

Ideation

Prototyping & Pattern
Making

Prototyping & Pattern
Making

Finalize 1st Round
Prototypes for Summer &
Winter

Due Monday

Ideation Sketches

Ideation Sketches &
Materials

Prototypes

Prototypes

Prototyping / Final prep

Due Wednesday

Ideation Sketches

Ideation Sketches &
Materials

Prototypes

Prototypes

Prototyping / Final Prep

Methods & Materials

Create inspiration boards for details such as pockets, zippers, life safety, thermal regulation, etc. Ideation sketches based off of inspiration boards.

Continue ideation and finalize pieces to proceed with. Acquire material swatches and detailed finishes samples such as buttons, zippers, etc.

Create initial prototypes for pattern / fit for summer items.

Create initial prototypes for pattern / fit for winter items.

Final Presentation & Prototypes

Winter Term Midterm
Dated 2-5-2020



FEMALE SPECIFIC FIT AND FUNCTIONAL DESIGN FOR THE GRAND CANYON NATIONAL PARK SERVICE SEARCH AND RESCUE RANGER UNIFORMS.

Jennifer Null

ABOUT ME



HISTORY OF THE WOMENS NPS UNIFORM



1918

First female ranger is hired. Most females wore their husbands hunting clothes or "camping clothes"



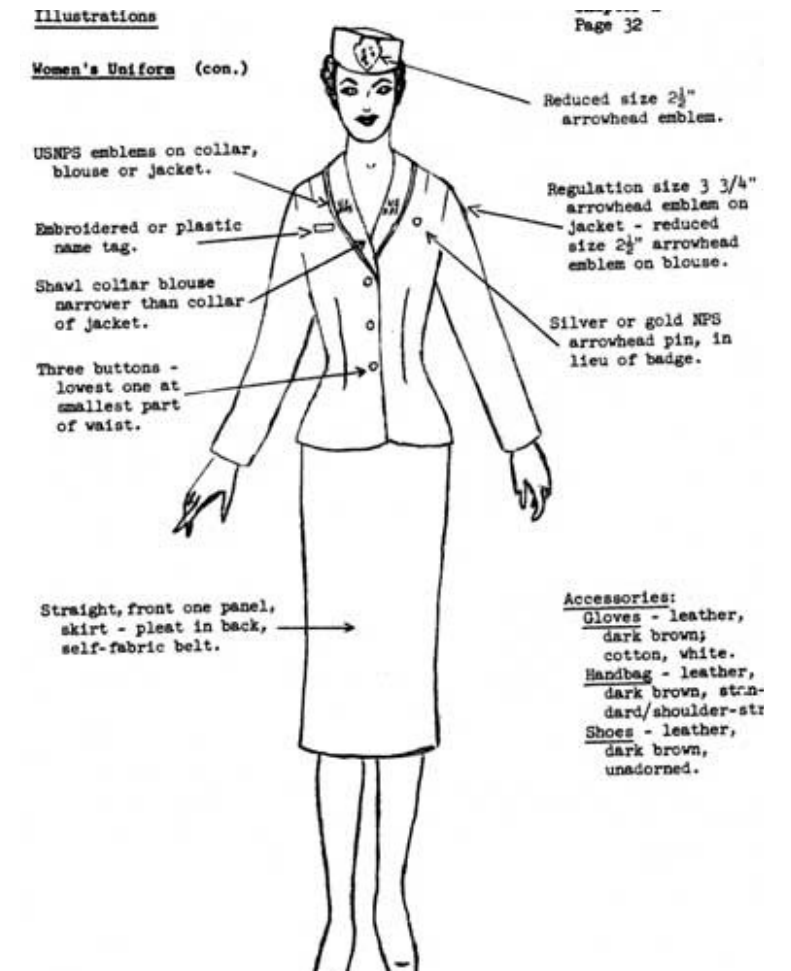
1941

Attack on Pearl Harbor calls men to war; women step in to fill all NPS roles. Unofficial material-saving (non-wool) uniform is created for women.



1947

First uniform regulations pertaining specifically to women was issued.



1959 - 1961

New "Stewardess" style women's uniform is distributed. (Not well received).

HISTORY OF THE WOMENS NPS UNIFORM



1970

Pants are introduced to the women's uniform. Later that year entirely new uniforms were introduced. They did not last long.



1974

"McDonald's" uniform. Included a pantsuit option.



1978

Women are allowed to wear the same "gray and green" uniform as men. One year later, due to lack of progress, a class action lawsuit is filed.



1980

One uniform supplier is contracted to furnish both men's and women's uniforms. Extended and special sizes are available.

“We run, we help bleeding people, we give CPR to dying bikers, we jump up on rocks, splash through creeks and clamber down mountainsides. We don't need to look like ladies. We need to look like a united team of functional people.”

-Alina Pontynen, Former NPS Ranger Interpreter

DESIGN CONSIDERATIONS



JOB ROLES



UNIFORM OPTIONS



ENVIRONMENT



MEASUREMENTS & FIT

JOB PERFORMANCE & RISKS



USER DATA

There are approximately 20,000 park rangers in the NPS workforce, less than 40% are female.



SEARCH & RESCUE

Under the role of protection: law enforcement, fire-fighting, public safety, visitor management, campground management, search and rescue and emergency medical services.



PHYSIOLOGICAL NEEDS

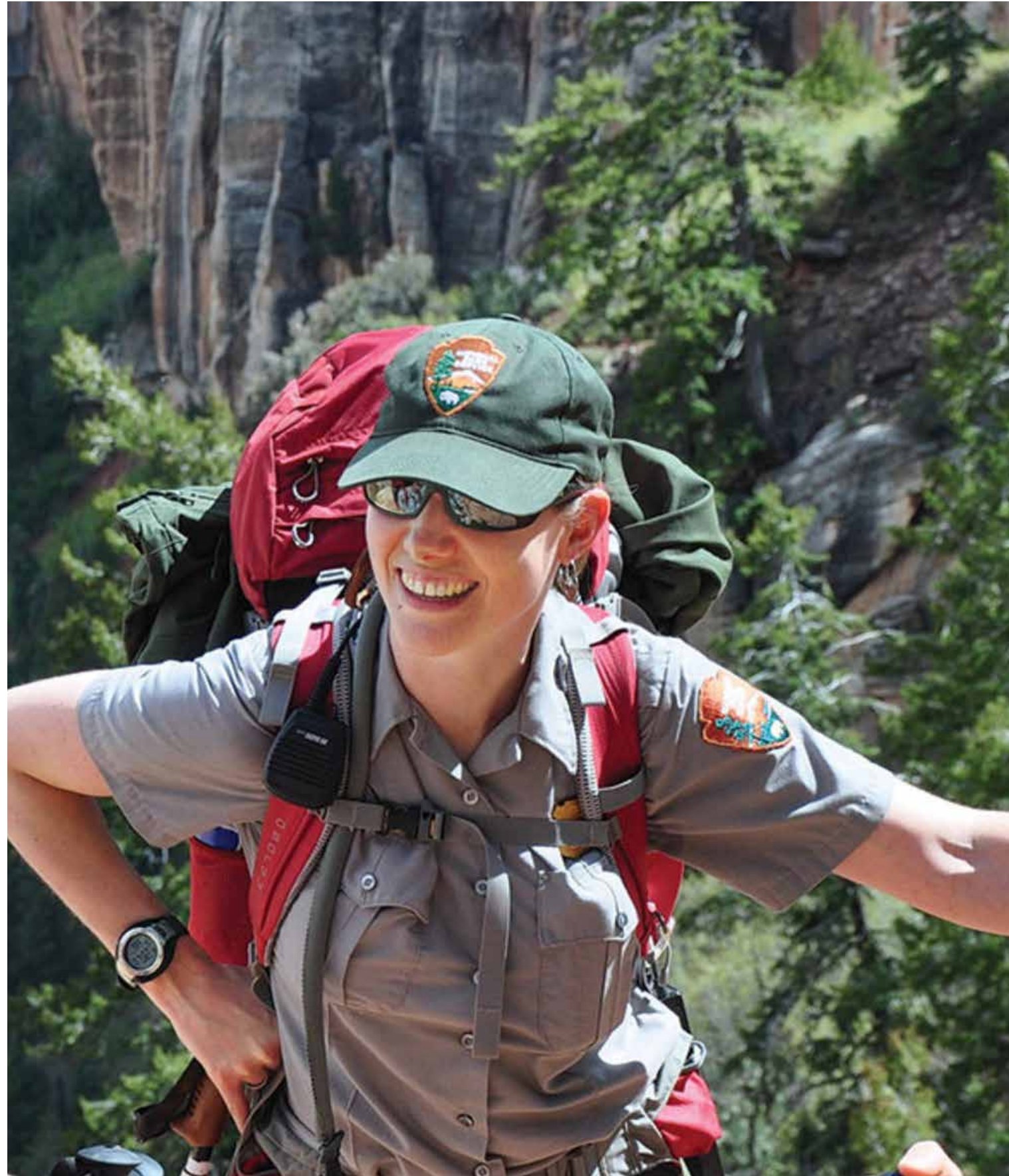
Walking, running, standing for long periods, hiking, lifting heavy objects, climbing, water or air rescues, carrying heavy loads, extreme temperature changes



HAZARDS

Remoteness, response time to emergencies, criminals, weather, rugged terrain, size of the park and wildlife are all potential hazards for rangers.

USER - GRAND CANYON SEARCH & RESCUE



TYPES OF SEARCH & RESCUE PERSONNEL

NPS Park Rangers
Preventative
Emergency Services
First Responders
Law Enforcement

USER SPECIFIC DESIGN

Female Fit
Full-time / Seasonal
NPS Employee
NPS Ranger Uniform
First Responders &
Preventative
Summer & Winter
Grand Canyon

ENVIRONMENTAL CONSIDERATIONS - GRAND CANYON NATIONAL PARK



SIZE

The Grand Canyon is a mile deep, 277 miles long and 18 miles wide. While the park does not include the entire canyon, it measures 1,904 square miles in total.



VISITORS

The Grand Canyon was the 2nd most visited park in 2018 with 6,380,495 visitors.



TEMPERATURES

Hot, mostly dry weather in May and September; extremely hot, dry weather in June; and hot with monsoon thunderstorms in July and August.



ELEVATION CHANGE

Visitors frequently underestimate the temperature and difference in temperature from top of the rim to the bottom of the canyon.

GRAND CANYON NATIONAL PARK INJURY REPORTS



2017

Emergency Medical Service Incidents: 1,135

Fatalities: 20

Search and Rescue Incidents Total: 290

2018

Emergency Medical Service Incidents: 1,054

Fatalities: 17

Search and Rescue Incidents Total: 265

SUMMER & WINTER SEARCH & RESCUE UNIFORMS



SUMMER

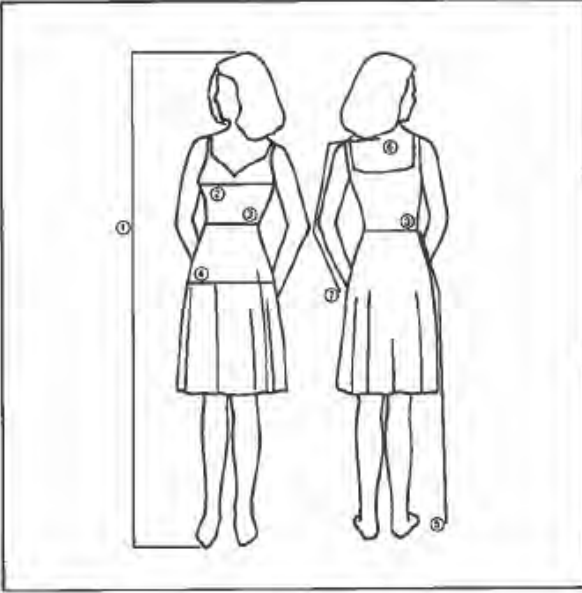
WINTER



FIT & MEASUREMENTS NPS UNIFORM CATALOG

FEMALE
HOW TO MEASURE FOR SIZE:
 HAVE SOMEONE ELSE MEASURE YOU. KEEP TAPE STRAIGHT, BUT NOT TIGHT. MEASURE OVER UNDERGARMENTS OF OTHER CLOTHING TO BE WORN UNDER YOUR UNIFORM.

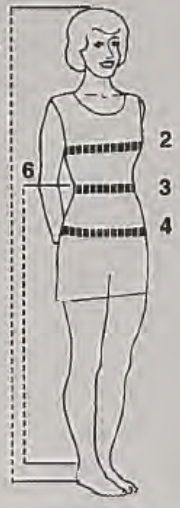
- HEIGHT:** STAND STRAIGHT AGAINST WALL IN STOCKING FEET. MAKE A MARK LEVEL WITH TOP OF HEAD. MEASURE FROM THIS POINT DOWN TO THE FLOOR. (SHOE HEELS CAN ADD INCHES TO YOUR HEIGHT).
- BUST:** MEASURE AROUND FULLEST PART OF BUST, HOLDING TAPE GENTLY. KEEP TAPE STRAIGHT AND LEVEL.
- WAIST:** MEASURE AROUND THE SMALLEST PART OF NATURAL WAISTLINE. HOLD TAPE FIRM, BUT NOT TIGHT. KEEP TAPE LEVEL AND BE SURE TO STAND NATURALLY.
- HIPS:** MEASURE AROUND THE FULLEST PART OF HIPS. HOLD THE TAPE MEASURE FIRM, BUT NOT TOO TIGHT. KEEP THE TAPE MEASURE STRAIGHT AND LEVEL.
- OUTSEAM:** PUT ON THE SHOES YOU PLAN ON WEARING. MEASURE FROM 3 TO 5, OR EXACTLY WHERE YOU WOULD LIKE YOUR SLACKS TO HIT ON YOUR SHOE.
- SLEEVE:** MEASURE FROM POINT 6 AT BACK OF NECK BRINGING TAPE OVER POINT OF SHOULDER TO POINT 7 ON WRIST WHERE YOU WOULD LIKE SLEEVE TO HIT.



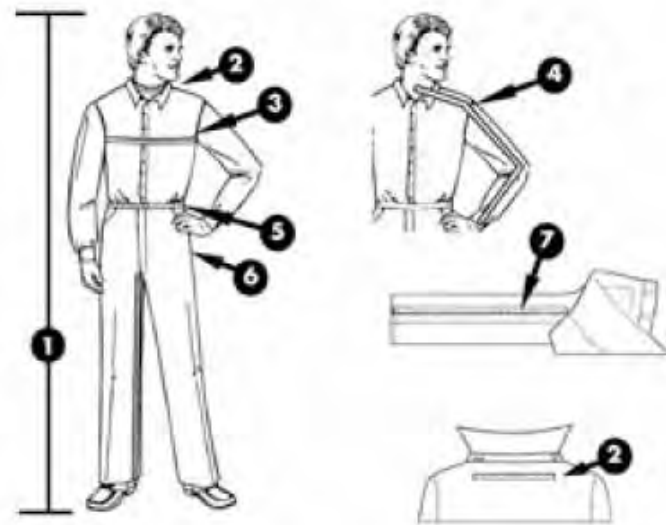
1981

FEMALE

- HEIGHT:** Stand straight against wall without shoes. Make a mark level with top of head. Measure from this point down to the floor.
- BUST:** Measure around fullest part of bust, holding tape gently. Keep tape straight and level.
- WAIST:** Measure around the smallest part of your waistline, holding tape firmly, but not tightly. Keep the tape level and be sure to stand naturally.
- HIPS:** Measure around the fullest part of hips. Hold the tape measure firmly, but not tightly. Keep the tape straight and level.
- SLEEVE:** Measure from middle of back of neck at point 5, across the shoulder and around point of elbow to wrist at point 5a.
- OUTSEAM:** Put on the shoes you plan to wear with your uniform. Measure from the top of waistband, point 3, over the hips to exactly where you would like your slacks to touch your shoe. Slacks should be hemmed 1" from top of shoe heel.



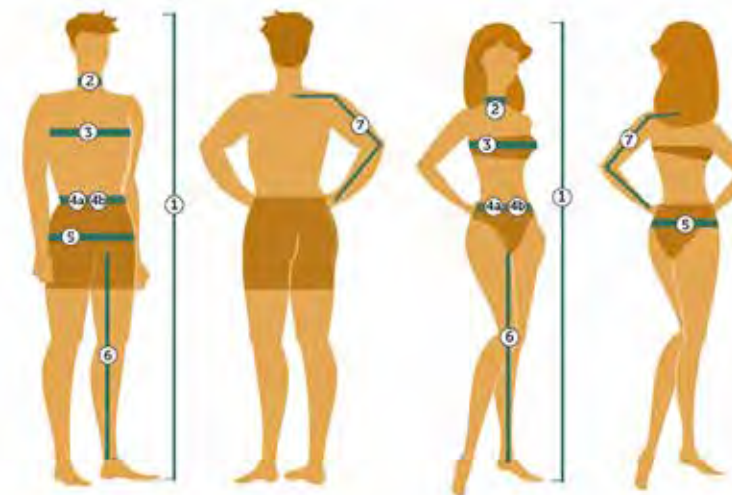
1991 - 1996



MY MEASUREMENTS

Height (1) _____
 Neck (2) _____
 Chest/Bust (3) _____
 Sleeve (4) _____
 Waist (5) _____
 Hips (6) _____
 Inseam (7) _____

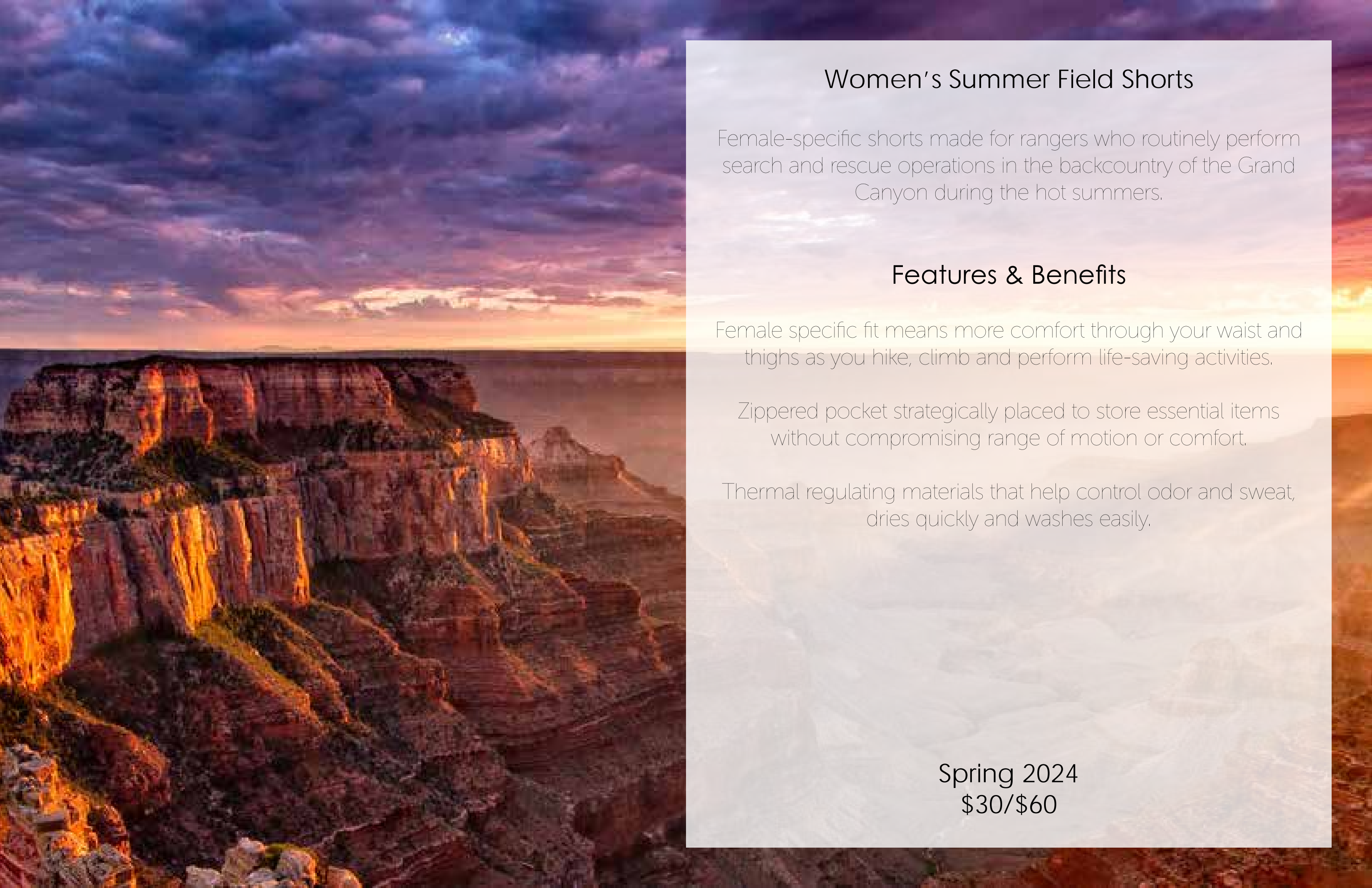
2006



My Measurements

Height (1) _____
 Neck (2) _____
 Chest/Bust (3) _____
 Waist (4) _____
 Hips (5) _____
 Inseam (6) _____
 Sleeve (7) _____

2016



Women's Summer Field Shorts

Female-specific shorts made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the hot summers.

Features & Benefits

Female specific fit means more comfort through your waist and thighs as you hike, climb and perform life-saving activities.

Zippered pocket strategically placed to store essential items without compromising range of motion or comfort.

Thermal regulating materials that help control odor and sweat, dries quickly and washes easily.

Spring 2024
\$30/\$60

Women's Summer Field Shirt

Female-specific field shirt made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the hot summers.

Features & Benefits

Female specific fit means more comfort through the chest and arms, so you spend less time adjusting your clothing as you hike, climb and perform life-saving activities.

Thermal regulating materials that help control odor and sweat, dries quickly and washes easily.

Spring 2024
\$25/\$50



Women's Winter Field Jacket

Female-specific field jacket made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the frigid winters.

Features & Benefits

Female specific fit means more comfort through the chest and arms, so you spend less time adjusting your clothing as you hike, climb and perform life-saving activities.

Professional and unified appearance of the jacket ensures you are recognizable as a NPS ranger.

Breathable insulation that keeps you warm and dry.

Multiple zippered pockets for essential items and a place to keep your phone and radio easily accessible.

Winter 2024
\$75/\$150

Women's Insulated Winter Bib

Female-specific fit cold weather pants made for rangers who routinely perform search and rescue operations in the backcountry of the Grand Canyon during the frigid winters.

Features & Benefits

Female specific fit means more comfort through your waist and thighs as you hike, climb and perform life-saving activities.

Zippered pocket strategically placed to store essential items without compromising range of motion or comfort.

Breathable insulation that keeps you warm and dry.

Winter 2024
\$60/\$120

INSPIRATION



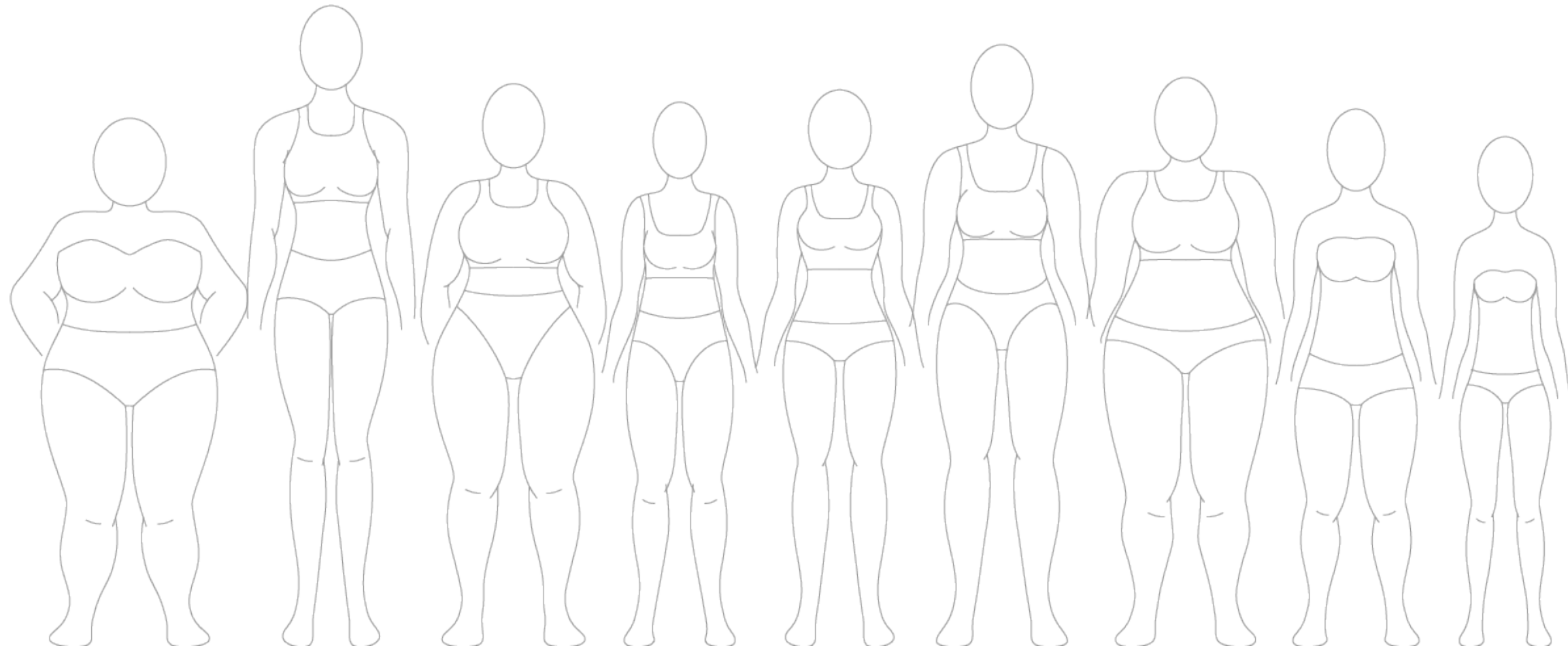
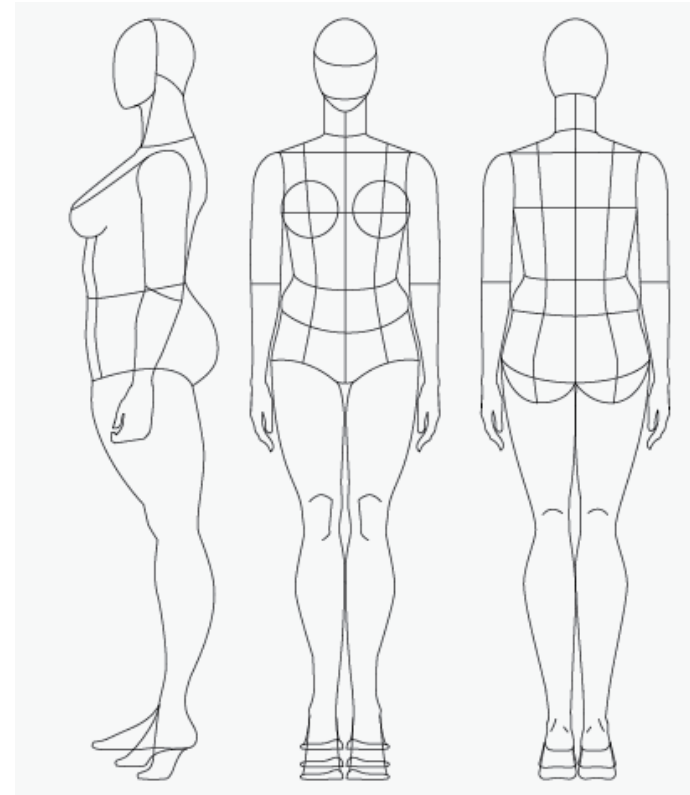
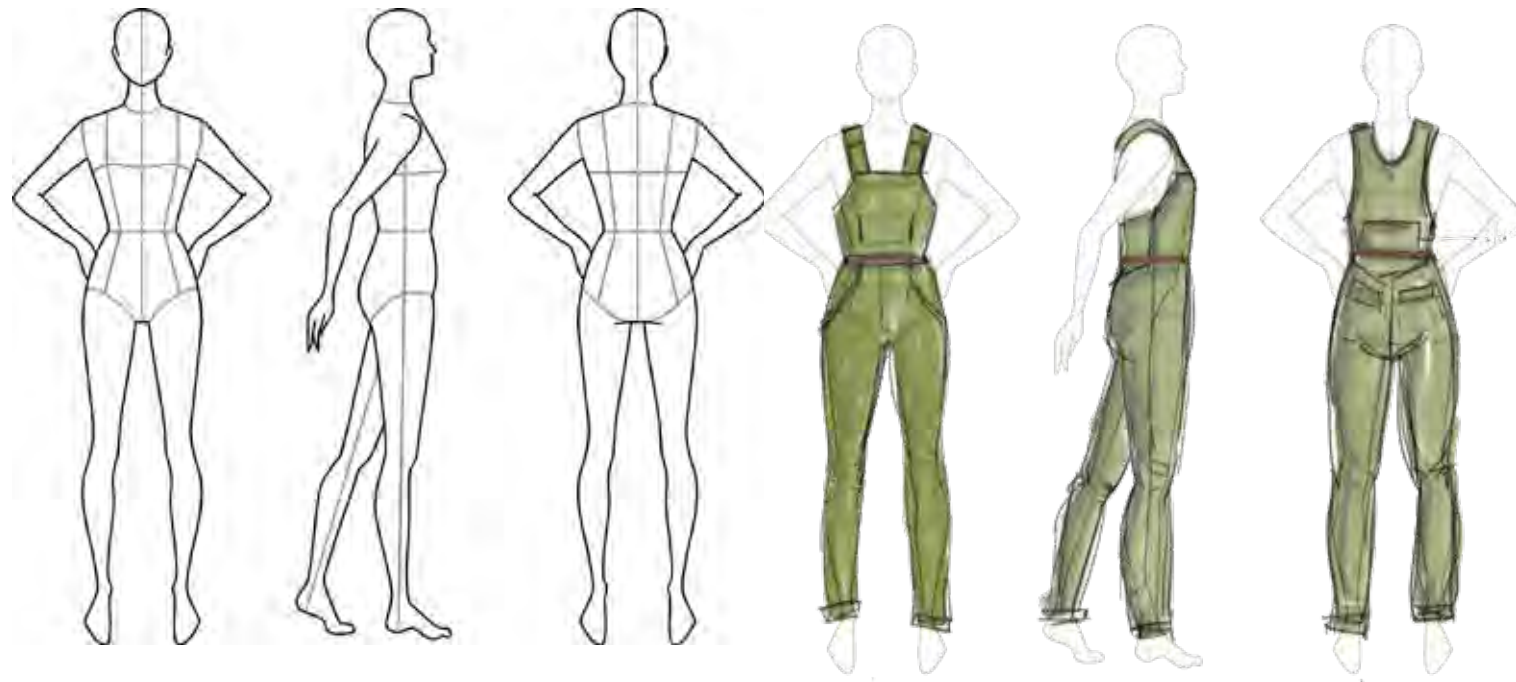
INSPIRATION - SUMMER & WINTER



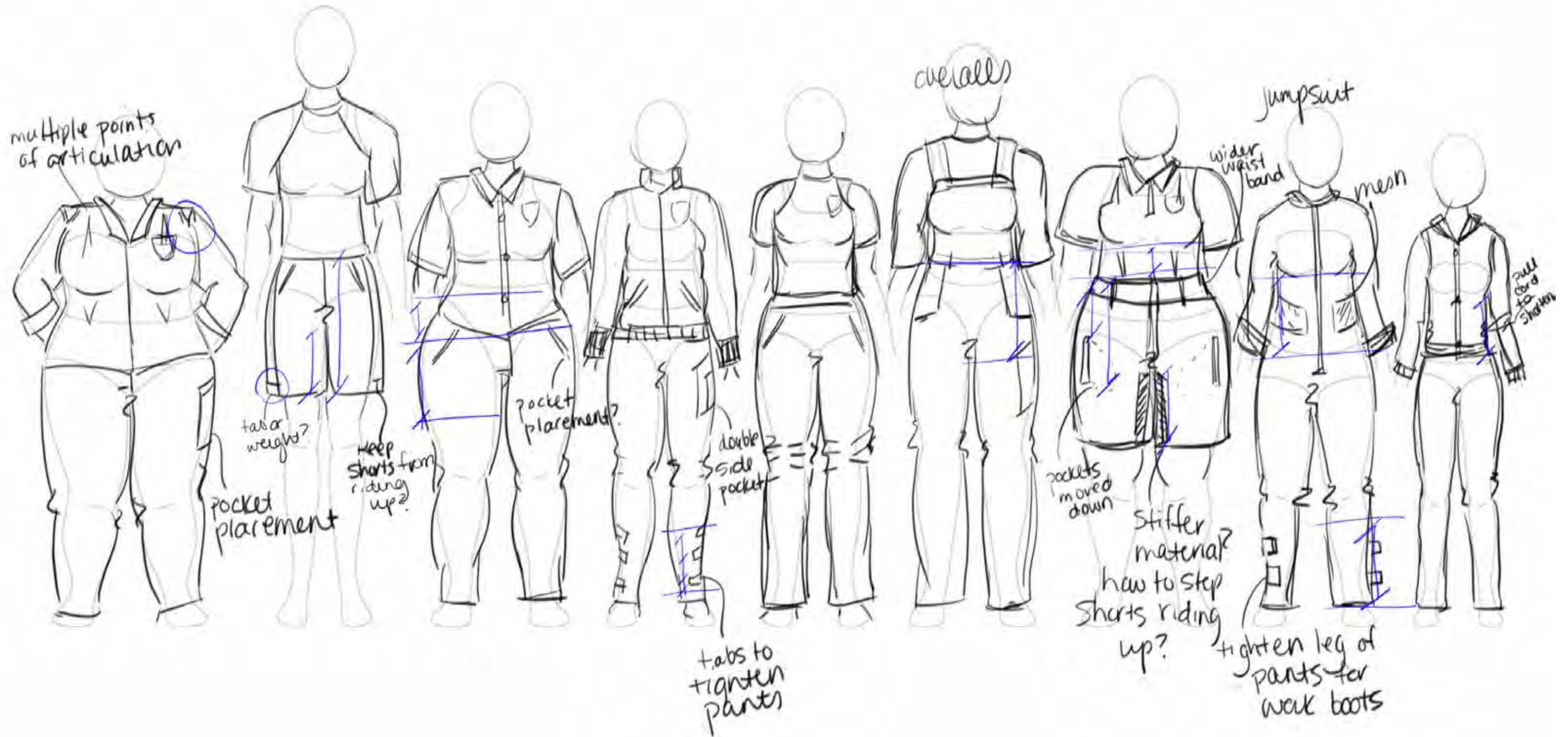
INSPIRATION - POCKETS



IDEATION - NEW CROQUIS



IDEATION - SKETCHES



FIT TESTING - POSES



Week of February 9 - 15	Week of February 16 - 22	Week of February 23 - 29	Week of March 1 - 7	Week of March 8 - 14
<p>Monday</p> <p>Ideation Collect inspiration images</p>	<p>Monday</p> <p>Collect inspiration images Create final mood boards</p>	<p>Monday</p> <p>Pattern Making - summer shirt patterns</p>	<p>Monday</p> <p>Pattern Making - winter jacket patterns</p>	<p>Monday</p> <p>Finalize Patterns for summer shirt & shorts</p>
<p>Tuesday</p> <p>Ideation Sketches 5 sketch pages - shirts</p>	<p>Tuesday</p> <p>Material Ideation 5 sketch pages - jacket</p>	<p>Tuesday</p> <p>Prototype: 1 summer shirt</p>	<p>Tuesday</p> <p>Continue Pattern Making Begin proto of jacket</p>	<p>Tuesday</p> <p>Revise pattern for winter jacket; Final prep</p>
<p>Wednesday</p> <p>Ideation Sketches 5 sketch pages - shirts</p>	<p>Wednesday</p> <p>Material Ideation 5 sketch pages - jacket</p>	<p>Wednesday</p> <p>Pattern Making - summer shorts patterns</p>	<p>Wednesday</p> <p>Pattern Making - winter bib patterns</p>	<p>Wednesday</p> <p>Revise pattern for winter bibs; Final prep</p>
<p>Thursday</p> <p>Ideation Sketches 5 sketch pages - shorts</p>	<p>Thursday</p> <p>Material Ideation 5 sketch pages - bibs</p>	<p>Thursday</p> <p>Prototypes 1 pair of shorts</p>	<p>Thursday</p> <p>Continue Pattern Making Begin proto of bibs</p>	<p>Thursday</p> <p>Term Paper</p>
<p>Friday, Sat, Sun</p> <p>Ideation Sketches 5 sketch pages - shorts Collect inspiration images</p>	<p>Friday, Sat, Sun</p> <p>5 sketch pages - bibs Acquire material swatches. Define mat'l test methods</p>	<p>Friday, Sat, Sun</p> <p>Revise summer patterns & 2nd round prototypes Define fit testing methods</p>	<p>Friday, Sat, Sun</p> <p>Complete 1st round winter proto; Begin revising summer patterns</p>	<p>Friday, Sat, Sun</p> <p>Term Paper</p>

MENTORSHIP TEAM

Charity Fox
Senior Technical Designer - Outerwear
Outdoor Research

Nancy Russell
Archivist - NPS History Collection
National Park Service

Ramie Lynch
Uniform Program Manager
National Park Service

Winter Term Final Presentation
Dated 3-11-2020



FEMALE SPECIFIC FIT AND FUNCTIONAL DESIGN FOR THE GRAND CANYON NATIONAL PARK SERVICE SEARCH AND RESCUE RANGER UNIFORMS.

Jennifer Null

HISTORY OF THE WOMENS NPS UNIFORM



1918

First female ranger is hired. Most females wore their husbands hunting clothes or "camping clothes"



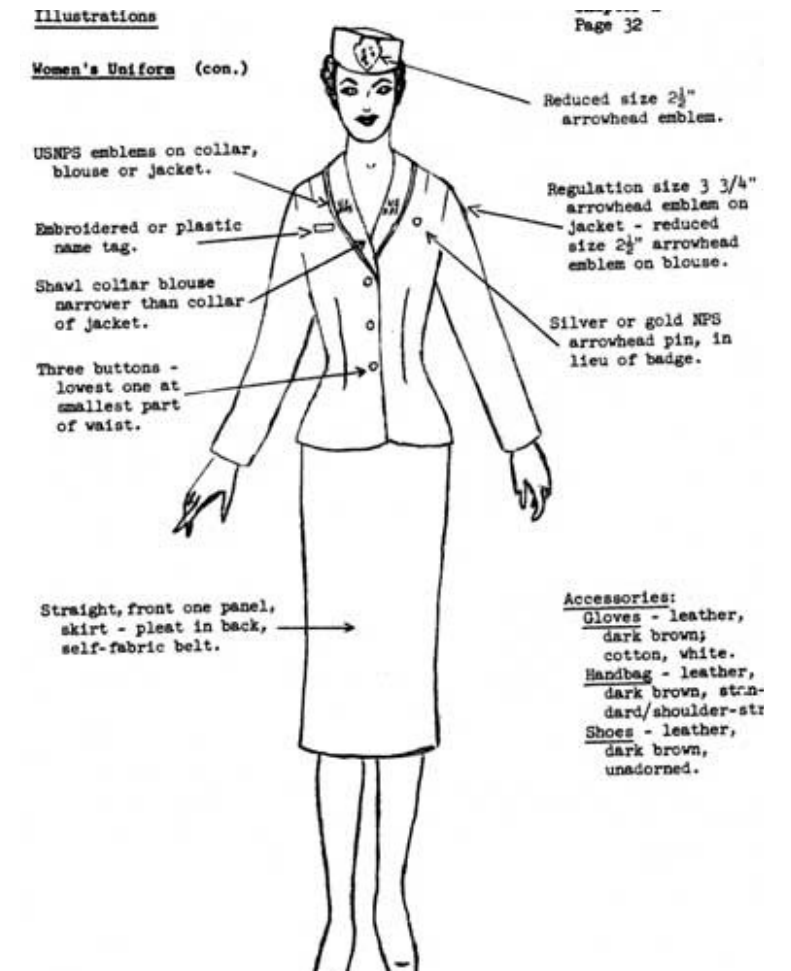
1941

Attack on Pearl Harbor calls men to war; women step in to fill all NPS roles. Unofficial material-saving (non-wool) uniform is created for women.



1947

First uniform regulations pertaining specifically to women was issued.



1959 - 1961

New "Stewardess" style women's uniform is distributed. (Not well received).

HISTORY OF THE WOMENS NPS UNIFORM



1970

Pants are introduced to the women's uniform. Later that year entirely new uniforms were introduced. They did not last long.



1974

"McDonald's" uniform. Included a pantsuit option.



1978

Women are allowed to wear the same "gray and green" uniform as men. One year later, due to lack of progress, a class action lawsuit is filed.



1980

One uniform supplier is contracted to furnish both men's and women's uniforms. Extended and special sizes are available.

“We run, we help bleeding people, we give CPR to dying bikers, we jump up on rocks, splash through creeks and clamber down mountainsides. We don't need to look like ladies. We need to look like a united team of functional people.”

-Alina Pontynen, Former NPS Ranger Interpreter

DESIGN CONSIDERATIONS



JOB ROLES



UNIFORM OPTIONS



ENVIRONMENT



MEASUREMENTS & FIT

JOB PERFORMANCE & RISKS



USER DATA

There are approximately 20,000 park rangers in the NPS workforce, less than 40% are female.



SEARCH & RESCUE

Under the role of protection: law enforcement, fire-fighting, public safety, visitor management, campground management, search and rescue and emergency medical services.



PHYSIOLOGICAL NEEDS

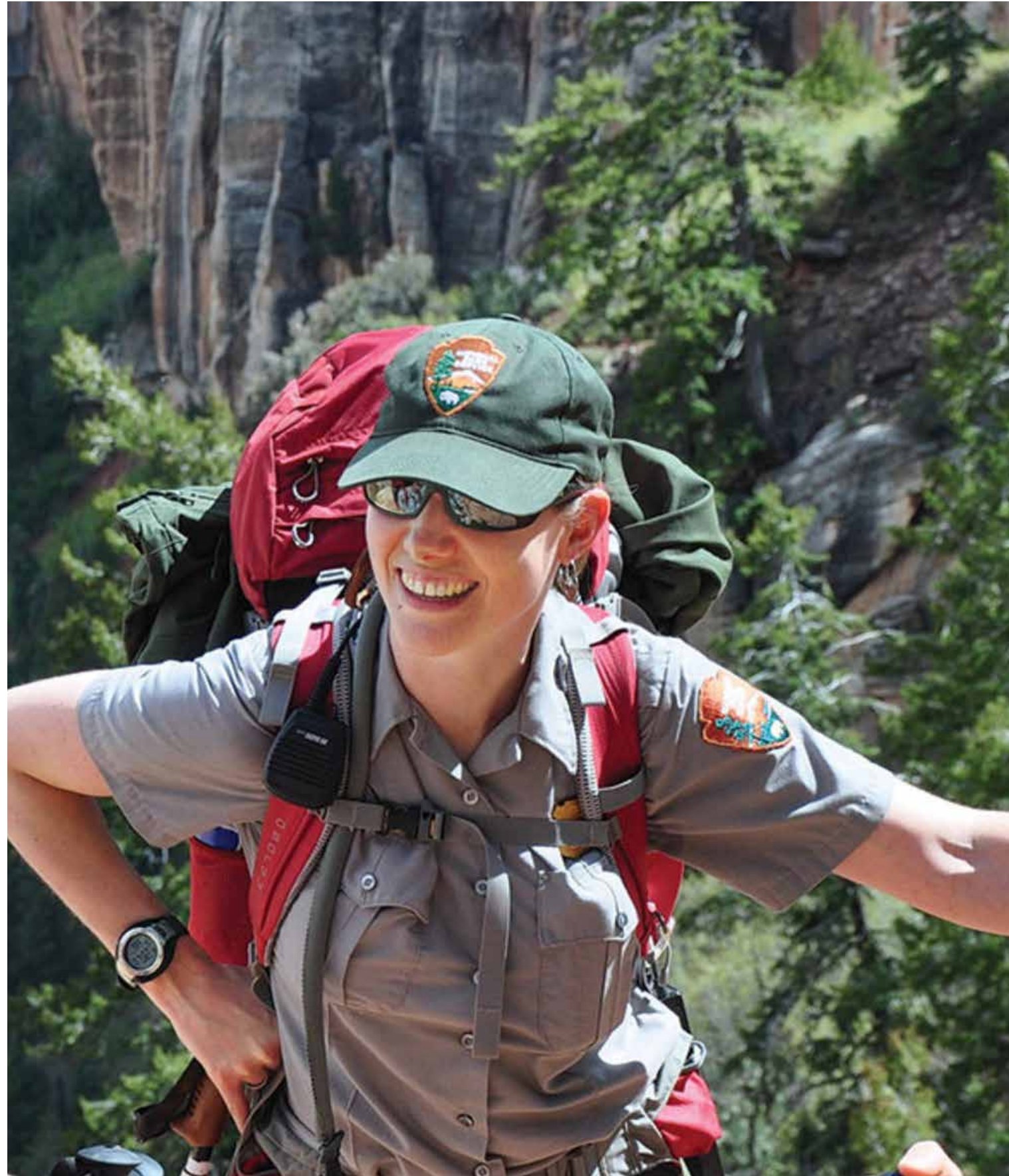
Walking, running, standing for long periods, hiking, lifting heavy objects, climbing, water or air rescues, carrying heavy loads, extreme temperature changes



HAZARDS

Remoteness, response time to emergencies, criminals, weather, rugged terrain, size of the park and wildlife are all potential hazards for rangers.

USER - GRAND CANYON SEARCH & RESCUE



TYPES OF SEARCH & RESCUE PERSONNEL

- NPS Park Rangers
- Preventative
- Emergency Services
- First Responders
- Law Enforcement

USER SPECIFIC DESIGN

- Female Fit
- Full-time / Seasonal
- NPS Employee
- NPS Ranger Uniform
- First Responders & Preventative
- Summer & Winter
- Grand Canyon

STORAGE NEEDS

BACK OR SIDE
POCKETS



CLIPPED TO BELT



POCKET OR
CLIPPED TO BELT



ENVIRONMENTAL CONSIDERATIONS - GRAND CANYON NATIONAL PARK



SIZE

The Grand Canyon is a mile deep, 277 miles long and 18 miles wide. While the park does not include the entire canyon, it measures 1,904 square miles in total.



VISITORS

The Grand Canyon was the 2nd most visited park in 2018 with 6,380,495 visitors.



TEMPERATURES

Hot, mostly dry weather in May and September; extremely hot, dry weather in June; and hot with monsoon thunderstorms in July and August.



ELEVATION CHANGE

Visitors frequently underestimate the temperature and difference in temperature from top of the rim to the bottom of the canyon.

GRAND CANYON NATIONAL PARK INJURY REPORTS



2017

Emergency Medical Service Incidents: 1,135

Fatalities: 20

Search and Rescue Incidents Total: 290

2018

Emergency Medical Service Incidents: 1,054

Fatalities: 17

Search and Rescue Incidents Total: 265

SUMMER & WINTER SEARCH & RESCUE UNIFORMS



SUMMER

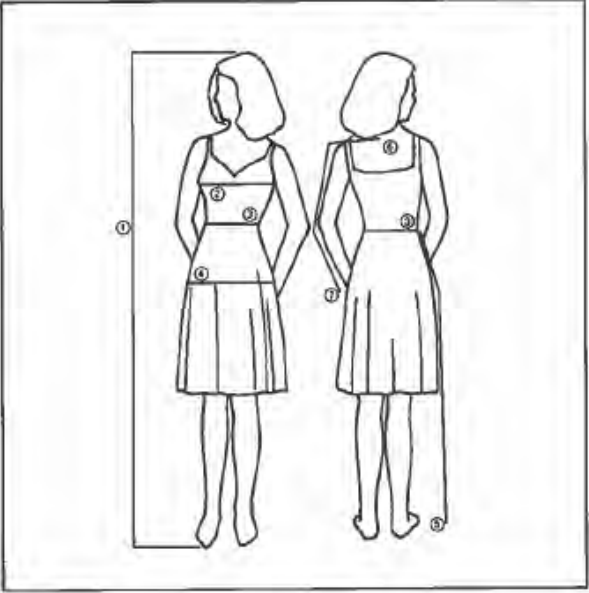
WINTER



FIT & MEASUREMENTS NPS UNIFORM CATALOG

FEMALE
HOW TO MEASURE FOR SIZE:
 HAVE SOMEONE ELSE MEASURE YOU. KEEP TAPE STRAIGHT, BUT NOT TIGHT. MEASURE OVER UNDERGARMENTS OF OTHER CLOTHING TO BE WORN UNDER YOUR UNIFORM.

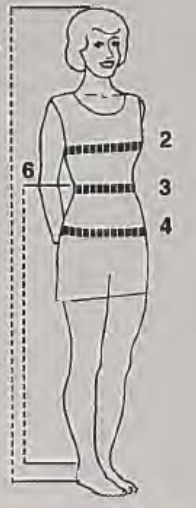
- HEIGHT:** STAND STRAIGHT AGAINST WALL IN STOCKING FEET. MAKE A MARK LEVEL WITH TOP OF HEAD. MEASURE FROM THIS POINT DOWN TO THE FLOOR. (SHOE HEELS CAN ADD INCHES TO YOUR HEIGHT).
- BUST:** MEASURE AROUND FULLEST PART OF BUST, HOLDING TAPE GENTLY. KEEP TAPE STRAIGHT AND LEVEL.
- WAIST:** MEASURE AROUND THE SMALLEST PART OF NATURAL WAISTLINE. HOLD TAPE FIRM, BUT NOT TIGHT. KEEP TAPE LEVEL AND BE SURE TO STAND NATURALLY.
- HIPS:** MEASURE AROUND THE FULLEST PART OF HIPS. HOLD THE TAPE MEASURE FIRM, BUT NOT TOO TIGHT. KEEP THE TAPE MEASURE STRAIGHT AND LEVEL.
- OUTSEAM:** PUT ON THE SHOES YOU PLAN ON WEARING. MEASURE FROM 3 TO 5, OR EXACTLY WHERE YOU WOULD LIKE YOUR SLACKS TO HIT ON YOUR SHOE.
- SLEEVE:** MEASURE FROM POINT 6 AT BACK OF NECK BRINGING TAPE OVER POINT OF SHOULDER TO POINT 7 ON WRIST WHERE YOU WOULD LIKE SLEEVE TO HIT.



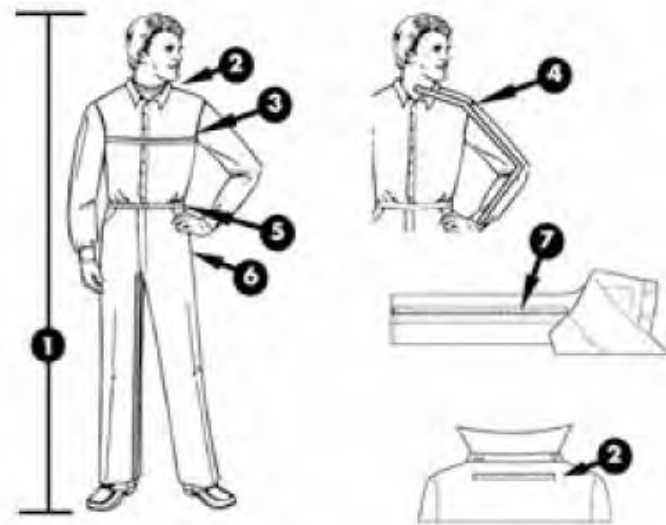
1981

FEMALE

- HEIGHT:** Stand straight against wall without shoes. Make a mark level with top of head. Measure from this point down to the floor.
- BUST:** Measure around fullest part of bust, holding tape gently. Keep tape straight and level.
- WAIST:** Measure around the smallest part of your waistline, holding tape firmly, but not tightly. Keep the tape level and be sure to stand naturally.
- HIPS:** Measure around the fullest part of hips. Hold the tape measure firmly, but not tightly. Keep the tape straight and level.
- SLEEVE:** Measure from middle of back of neck at point 5, across the shoulder and around point of elbow to wrist at point 5a.
- OUTSEAM:** Put on the shoes you plan to wear with your uniform. Measure from the top of waistband, point 3, over the hips to exactly where you would like your slacks to touch your shoe. Slacks should be hemmed 1" from top of shoe heel.

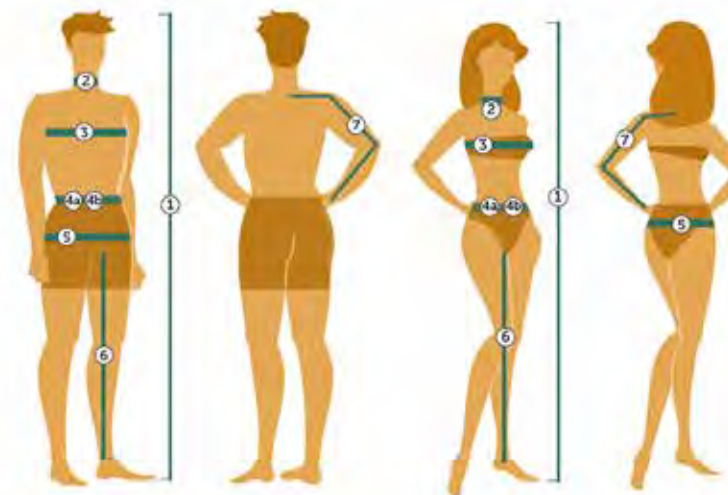


1991 - 1996



MY MEASUREMENTS

Height (1) _____
 Neck (2) _____
 Chest/Bust (3) _____
 Sleeve (4) _____
 Waist (5) _____
 Hips (6) _____
 Inseam (7) _____



My Measurements

Height (1) _____
 Neck (2) _____
 Chest/Bust (3) _____
 Waist (4) _____
 Hips (5) _____
 Inseam (6) _____
 Sleeve (7) _____

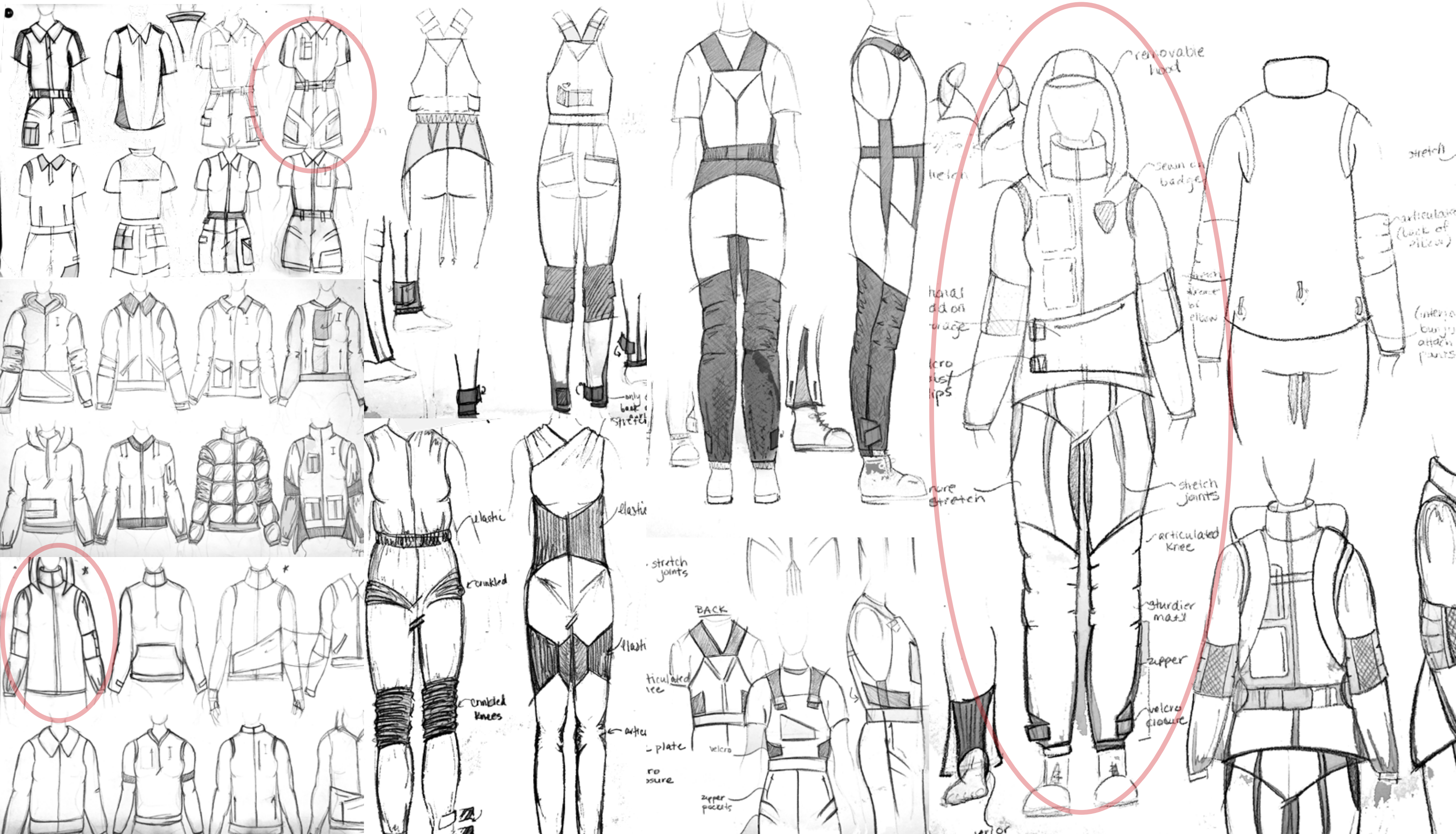
2006

2016

INSPIRATION - HISTORY & PRIDE



IDEATION - SKETCHES



IDEATION - STRETCH PANELS



PROTOTYPING - WINTER BIBS





PROTOTYPING - WINTER JACKET

NEXT STEPS

MARCH

Week of March 22

- Prototyping / finalize patterns for winter bibs
- Finalize materials for winter bibs and winter jacket
- Fit testing for shirt and shorts

Week of March 29

- Prototyping / finalize patterns for winter jacket
- prototyping summer shirt

APRIL

Week of April 5

- Prototyping summer shorts
- Following the pattern from bib pants

Week of April 12

- Buffer week

Week of April 19

- Field testing for winter bibs and winter jacket
- Collect final data including athlete insights, material behavior and fit feedback
- Send final designs to NPS park ranger contacts to get feedback on designs

Week of April 26

- Field testing of shirt and cargo shorts
- Collect final data including athlete insights, material behavior and fit feedback
- Send final designs to NPS park ranger contacts to get feedback on designs

MAY

Week of May 3

- Complete final prototypes of winter bibs, jacket, shorts and shirt
- Take final photos
- Final sketches

Week of May 10

- Confirm final layout for display
- Purchase all materials for final display

Week of May 17

- Buffer week

Week of May 24

- Complete final display set up for finals week

MENTORSHIP TEAM

Charity Fox
Senior Technical Designer - Outerwear
Outdoor Research


Nancy Russell
Archivist - NPS History Collection
National Park Service

Ramie Lynch
Uniform Program Manager
National Park Service

Spring Term
Final Mood Board
Dated 4-22-2020

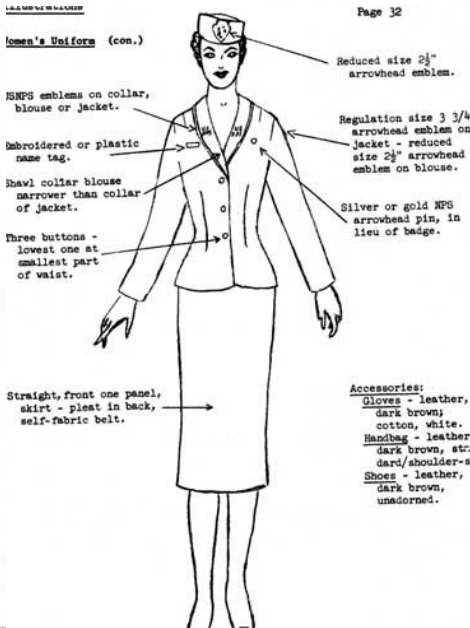


Spring Term Midterm
Dated 5-5-2020



NP WILD
Ranger Collection

INSPIRED BY SERVICE



1916

2020

1920s

Left to their own devices...Some wore a full men's uniform tailored for women, and others attached their badges to formal hunting coats...

1937

...wearing a man's style coat with a chic little hat perched on her head.

1947

First official women's uniform is authorized, 31 years after the founding of the NPS...classified under the heading of Special Uniforms.

1960

Women cannot be employed in certain jobs, such as Park Ranger, in which the employee is subject to be called to do strenuous or hazardous work.

1970

Although many women did not like the 1970 uniform for its impractical color and fabric, they did appreciate that it included a pantsuit option.

1960s

Exercising that 'old ranger know-how', She stuck the pin through her jacket and fastened it to her bra strap.

1970s

The new uniforms were more fluff than substance.

1970s

We climb hills and mountains and rocks. We tried bermuda shorts with knee socks; they didn't protect from poison ivy, stinging nettles or brambles in meadows. We need something more functional.

2013

Apparently female park rangers are expected to have ginormous butts and three-inch waists, according to the size of the trousers I received.

2019

We don't need to look like ladies.

PROBLEM STATEMENT



Outfitting the National Park Service female rangers has been a rough and often times controversial path. Early on, the women in the service would wear a make shift uniform, often times utilizing their husbands' hunting clothing or the men's uniform. Today, women's cut clothing is provided but is very similar to the men's uniform and inadequately addresses the unique body shape of the female rangers.

PROOF OF CONCEPT



Each piece in the NP Wild Park Ranger collection is designed specific to the needs of the U.S. National Park Service female rangers. Female-specific fit, body contouring stretch panels and waterproof and breathable materials are all use strategically to provide the most comfort without compromising movement, function, professional appearance and the historical color scheme that is synonymous with the U.S. National Park Rangers.

ATHLETE OUTCOMES

Each piece in the NP Wild Park Ranger collection has been re-designed from the current items available to female National Park Rangers based on feedback from current and former NPS rangers.

Currently Available



NP Wild Ranger Collection

FRAN CARGO SHORTS

Modern cargo shorts with hidden pockets for storage, contouring stretch panels at the thigh for shorts that move with the body and a breathable stretch fabric at the back of the waist keeping you cool.

CLAIRE WORKSHIRT

A modern take on the classic workshirt with lighter, breathable fabrics, strategically placed mesh panels to promote airflow and a faux placket to keep buttons from ever being an issue.

POLLY HIKING OVERALLS

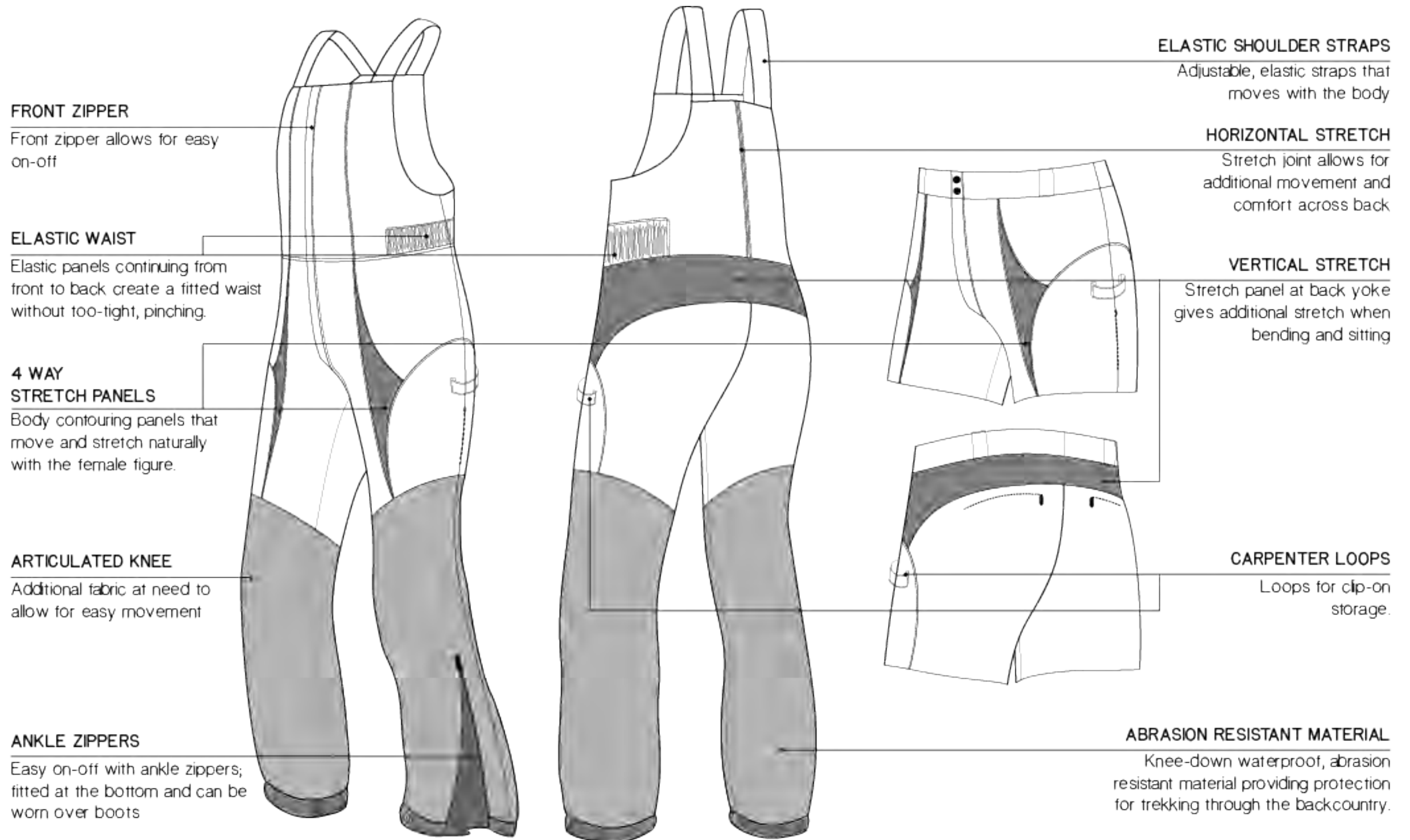
Lightweight hiking overalls with contouring stretch panels at the thighs for unrestricted movement, waterproof from the knee down for trekking and plenty of stretch and adjustability throughout.

BETTY RAIN JACKET

Medium-weight waterproof jacket with plenty of hidden pockets for storage, including a large pocket at small of back, gussets at the shoulders and a high-low hem providing unrestricted movement.

PARTS AND PURPOSE

POLLY HIKING OVERALLS AND FRAN CARGO SHORTS



PARTS AND PURPOSE

BETTY RAIN JACKET AND CLAIRE WORKSHIRT

STORAGE

Multiple zippered pocket options to keep phone, keys, note cards, emergency items, etc. secure

HIGH-LOW DESIGN

High - low hem provides less restricted movement in front

MOISTURE WICKING

Moisture wicking material at interior of collar keeps back of neck dry and cool

3/4 FAUX FRONT PLACKET

Faux placket provides a classic professional look without the common issues of buttons popping open, gaps and odd stretching. The top two buttons remain functional.

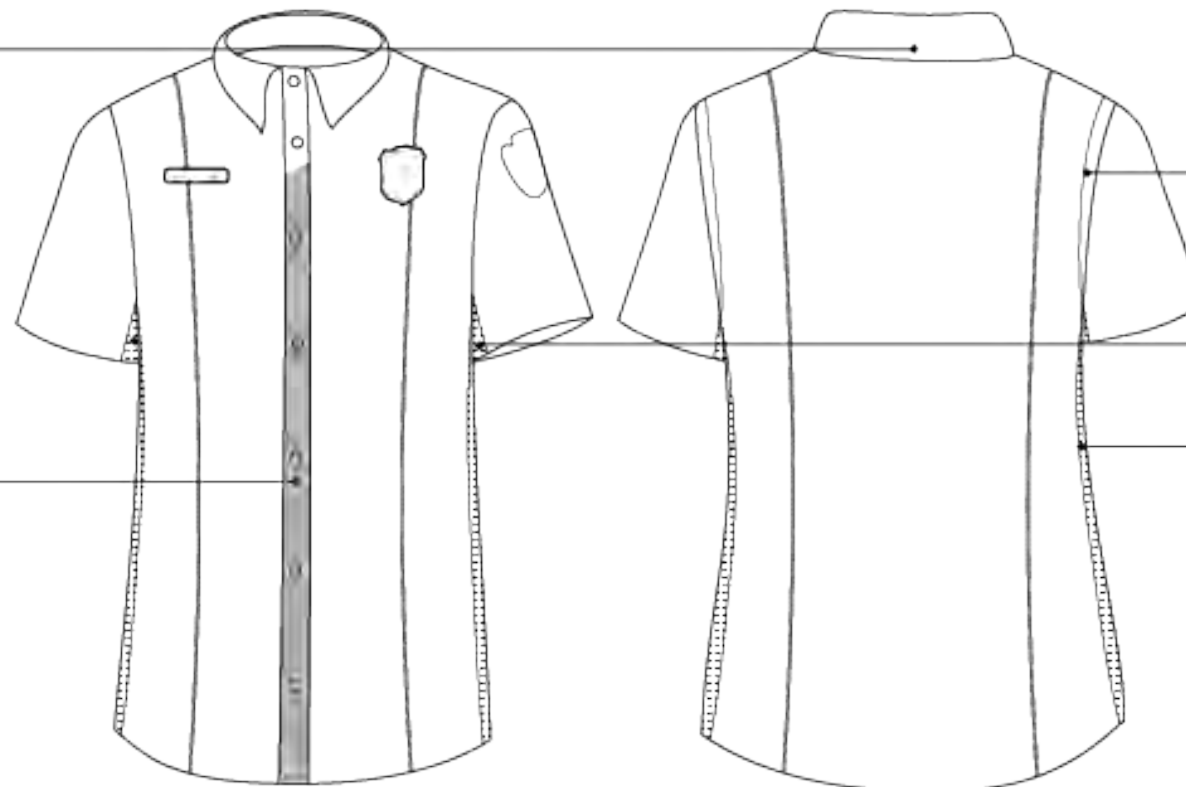


SHOULDER GUSSETS

Gussets at shoulder give extra room for less restricted movement

BACK POCKET

Easy access storage for larger items such as notepads or emergency items

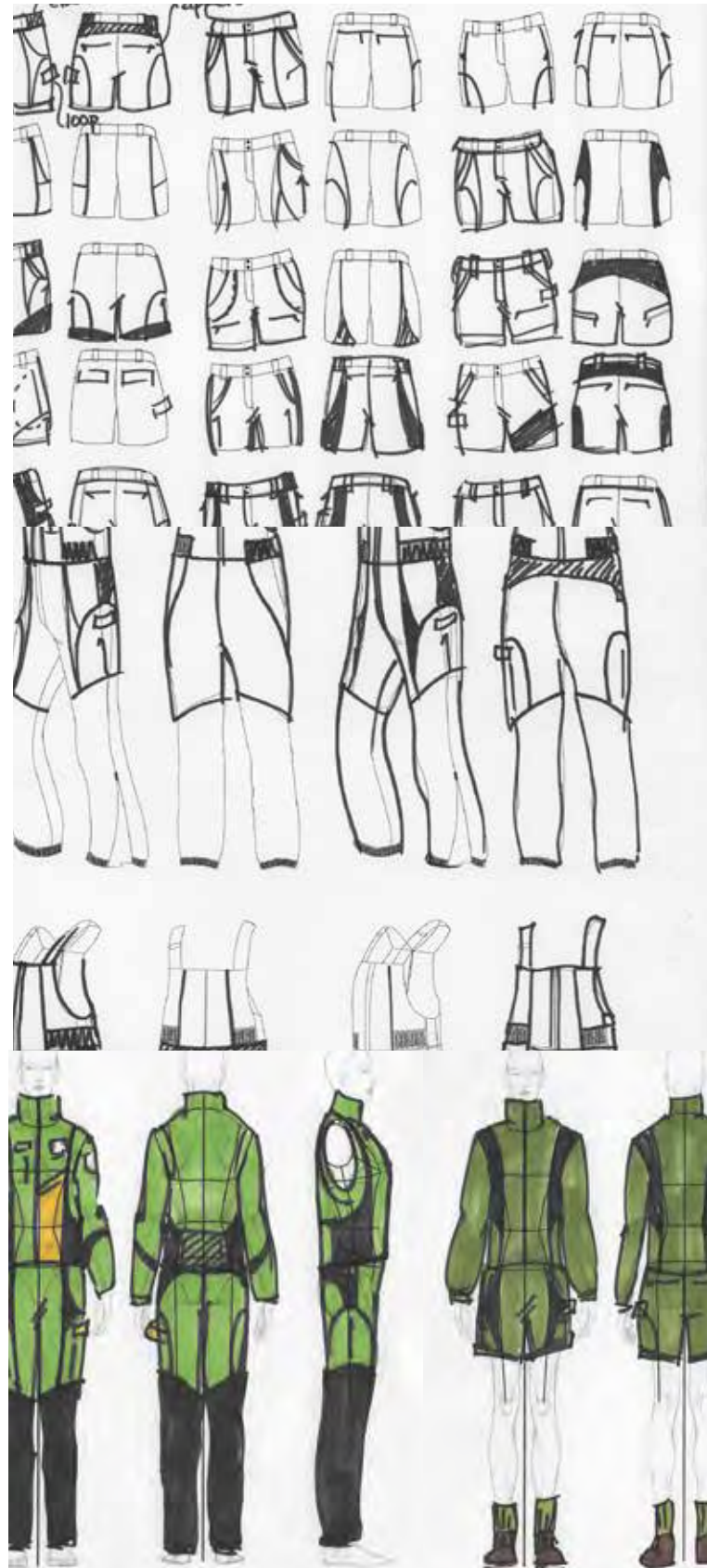


DOUBLE LAYER MESH

Double layer of mesh at sides and underarms stretches and allows airflow to keep cool

PROTOTYPES

POLLY HIKING OVERALLS AND FRAN CARGO SHORTS



PROTOTYPES

BETTY RAIN JACKET AND CLAIRE WORKSHIRT



VALIDATION: PERCEPTION TEST

1ST PERCEPTION TEST WITH ANDREA WILLINGHAM. FORMER U.S. NATIONAL PARK RANGER

HIKING OVERALLS / CARGO SHORTS

Likes

- Stretch panel on the back yoke. Good that it moves with you
- Stretch panels at thighs - cool shapes - looks very practical
- Overall perception: sleek sporty look
- Water resistant pants! Much needed for trekking.
- Long zipper down the front; easy on/off, don't have to fight with it
- All the adjustable parts make sense

Comments

- Additional pockets / cargo pockets on legs
- Loops for carabiner
- Secure storage - zippers, snaps, Velcro

WORKSHIRT

Likes

- Breathable material
- No permanent name tags; can keep getting passed down in the storage
- Color is very important
- faux front placket
- Mesh / moisture wicking materials at the collar

Comments

- Front, chest pockets are never really used; occasionally used to hold pens depending on where you are working
- Law enforcement rangers may use the pockets to keep their notepad but not all types of rangers would need them

RAIN JACKET

Likes

- Badge and nametag holder/ additional fabric (2 holes)
- High-low hem
- Materials of the jacket - fleece lined in the body and neck
- Removable hood; would only need to fit over ball cap (in the back country)
- Medium weight. Current jackets are a too heavy parka or a soft shell that is meant to go over a sweater. It would be nice to have a jacket that you can layer or wear over uniform shirt.

Comments

- Very sleek looking



“ I really like where you're going with this. I think it's a great improvement. ”
I think its both modernizing it but its also keeping it true to the aesthetic that most people know.

REMAINING VALIDATION PLAN

PERCEPTION TEST



Andrea Willingham
Former US National Park Ranger

FIT, FEEL, PERFORMANCE EXPERIENCE



Carly Anderson
Fit Model

EXPERT INTERVIEW



Charity Fox
Senior Technical Designer - Outerwear
Outdoor Research

EXPERT INTERVIEW



Nancy Russell
Archivist - NPS History Collection
National Park Service

PROTOTYPES REMAINING PLAN

MAY

Week of May 3

- Midterms
- Final jacket and overalls prototypes complete
- Shirt and shorts perception test

Week of May 10

- Fit test shirt
- Fit test cargo shorts

Week of May 17

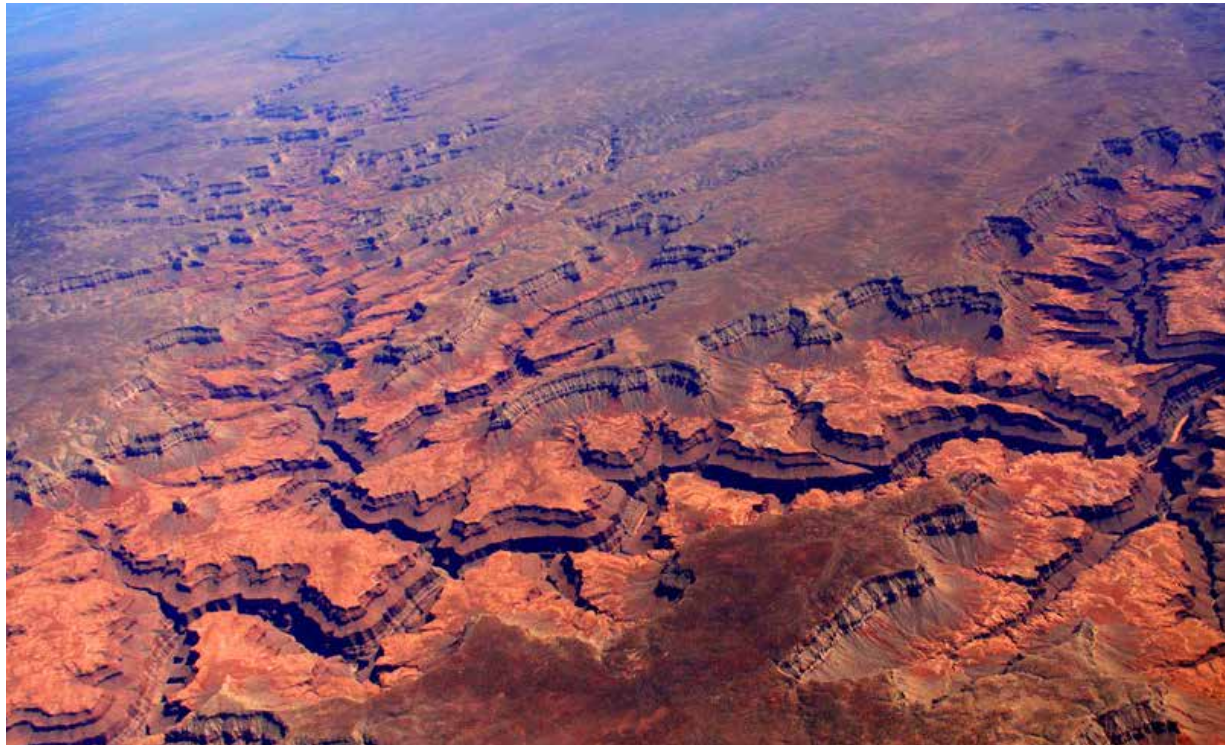
- Final shirt and cargo shorts prototypes complete

Week of May 24

- Final photos for website and final presentation



BRANDING: MOOD BOARD



BRANDING: COLOR WAYS

POLLY HIKING OVERALLS AND FRAN CARGO SHORTS



NPS Forest Green / Black / Wild Lime



NPS Forest Green



Black



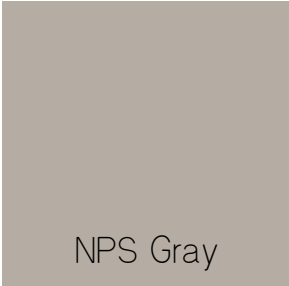
NPS Forest Green / Black / Wild Lime



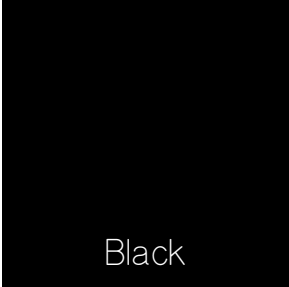
NPS Forest Green



Black



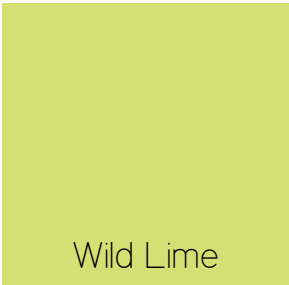
NPS Gray



Black



NPS Forest Green



Wild Lime



Canyon Orange

BRANDING: COLOR WAYS

BETTY RAIN JACKET AND CLAIRE WORKSHIRT



NPS Forest Green / Black / Wild Lime



NPS Forest Green



Black



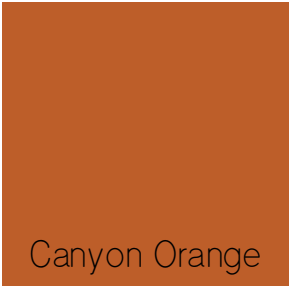
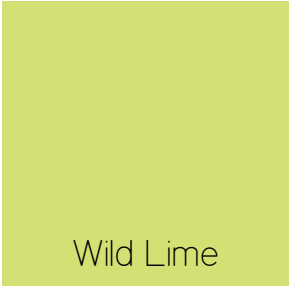
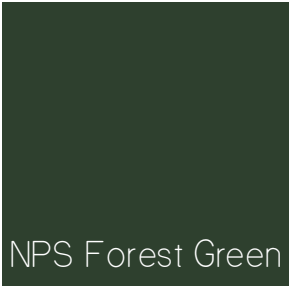
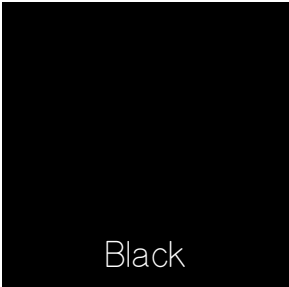
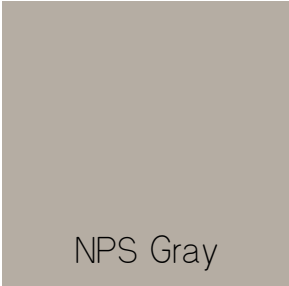
NPS Gray



Canyon Orange

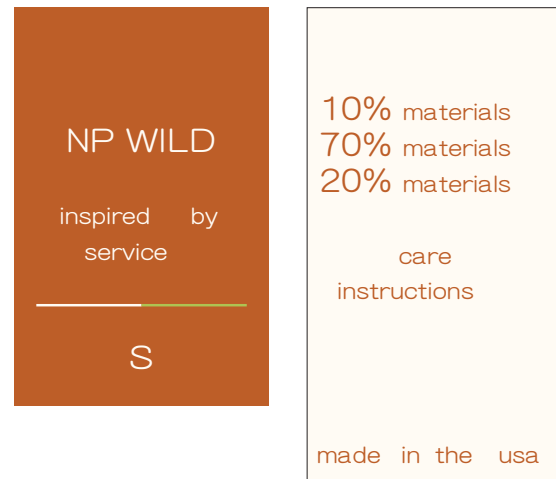


Wild Lime

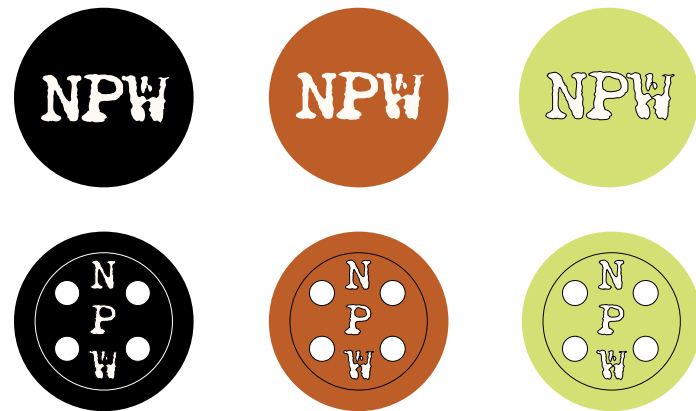


BRANDING: LABELS AND CLOSURES

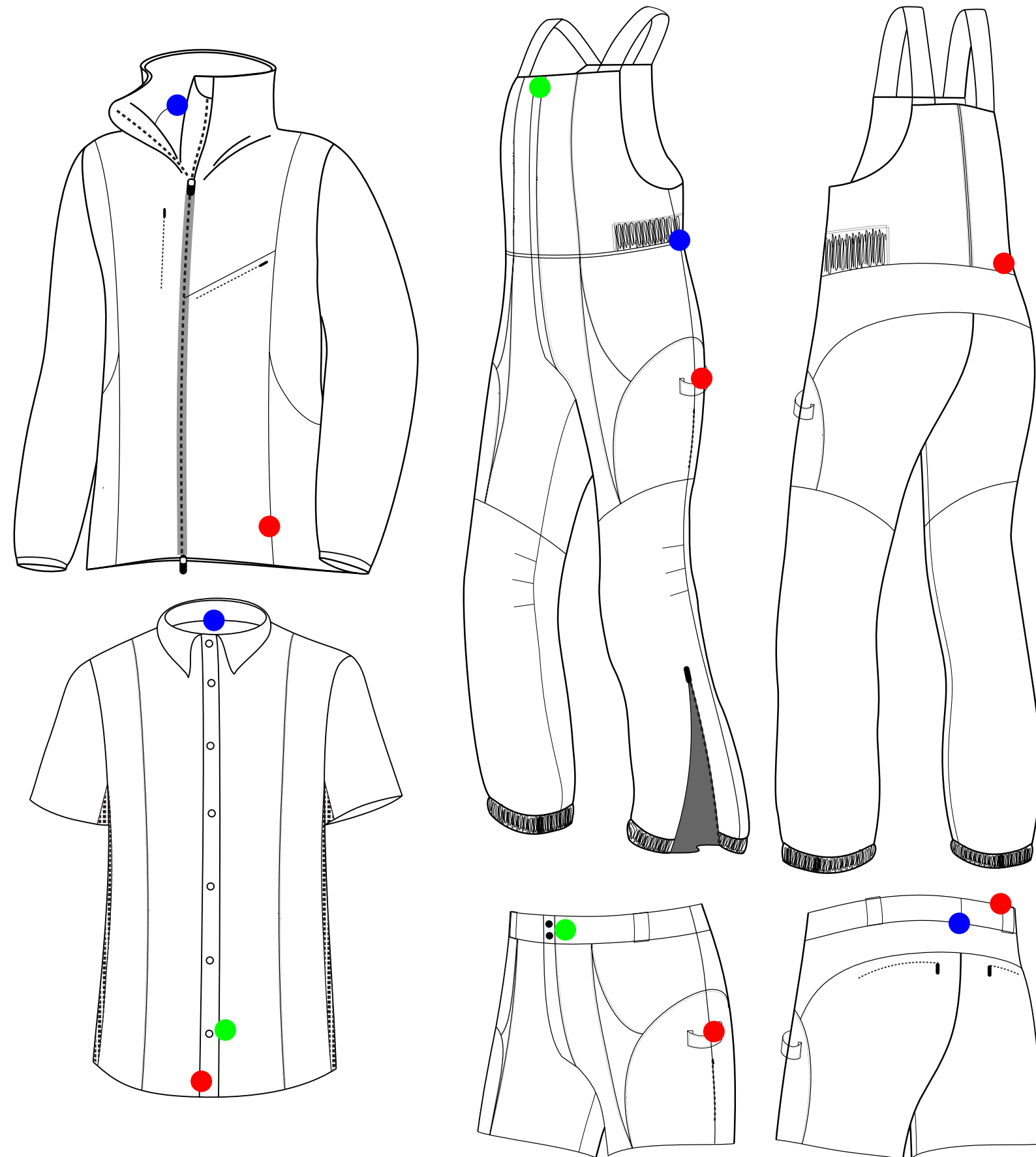
● INTERIOR / COLLAR TAGS



● BUTTONS / SNAPS



● EXTERIOR POCKET TAGS



BRANDING: HANGTAGS AND RANGER STORIES

HANG TAGS

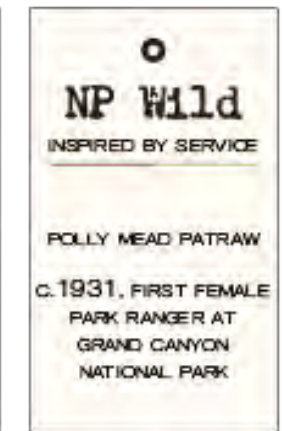


TECH INFO TAGS

RANGER STORY TAGS (FRONT)



RANGER STORY TAGS (BACK)



FULL BOOK



ALTERNATE HANG TAGS



BACKGROUND PHOTOS



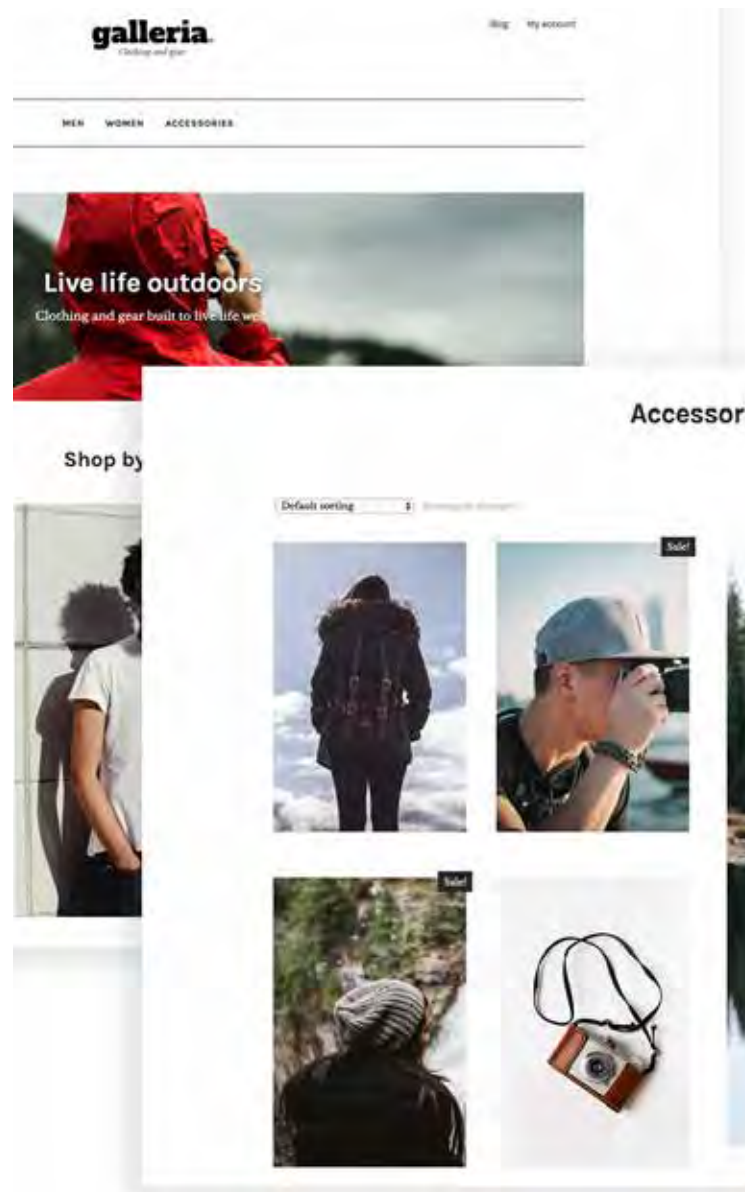
PRIMARY FONT

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890

SECONDARY FONT (USED SPARINGLY)

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 abcdefghijklmnopqrstuvwxyz
 1234567890

BRANDING: WEBSITE IDEATION



NATIONAL PARK HEAVY

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

NATIONAL PARK HEAVY

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

NATIONAL PARK HEAVY

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

NATIONAL PARK HEAVY

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

THANK YOU




Spring Term Final Presentation
Dated 6-4-2020

TRAILBLAZER



FEMALE SPECIFIC FUNCTIONAL APPAREL FOR NATIONAL PARK SERVICE RANGERS

A person wearing a dark uniform is walking through a shallow stream in a forest. The water is dark and rippling. The background shows trees and a large rock on the bank. The scene is captured in a cinematic style with natural lighting.

We run, we help bleeding people, we give CPR to dying bikers, we jump up on rocks, splash through creeks and clamber down mountainsides. We don't need to look like ladies. We need to look like a united team of functional people.

-Alina Pontynen, Former NPS Ranger Interpreter

PROBLEM STATEMENT



Outfitting the National Park Service female rangers has been a rough and often times controversial path. Early on, the women in the service would wear a make shift uniform, often times utilizing their husbands' hunting clothing or the men's uniform. Today, women's cut clothing is provided but is very similar to the men's uniform and inadequately addresses the unique body shape of the female rangers.

CURRENT UNIFORMS



DESIGN CONSIDERATIONS



PHYSIOLOGICAL NEEDS

WALKING, RUNNING, STANDING FOR LONG PERIODS, HIKING, LIFTING HEAVY OBJECTS, CLIMBING, WATER OR AIR RESCUES, CARRYING HEAVY LOADS, EXTREME TEMPERATURE CHANGES



JOB HAZARDS

REMOTENESS, RESPONSE TIME TO EMERGENCIES, CRIMINALS, WEATHER, RUGGED TERRAIN, SIZE OF THE PARK AND WILDLIFE ARE ALL POTENTIAL HAZARDS FOR RANGERS.



HISTORY

HONORING THE HISTORY OF THE NATIONAL PARK SERVICE, WOMEN'S HISTORY, EQUALITY, ICONIC COLORS AND DETAILS, PRIDE POINTS

PROBLEMS TO SOLVE



MATERIALS



STRETCH / MOBILITY



STORAGE



HISTORY / APPEARANCE

RESEARCH METHODS

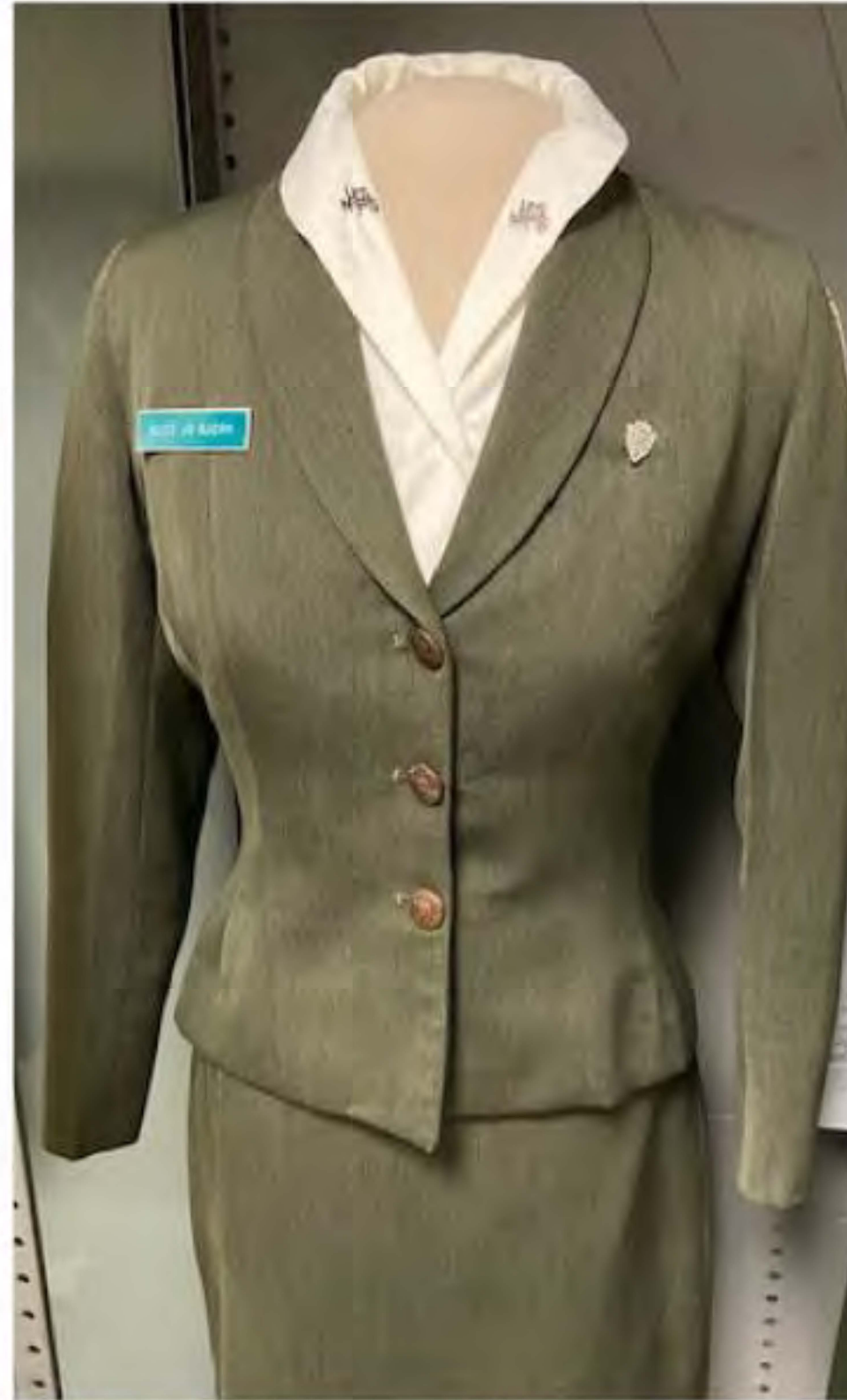


Andrea Willingham
Former US National Park Ranger



Nancy Russell
Archivist - NPS History Collection
National Park Service

EXPERT INTERVIEWS



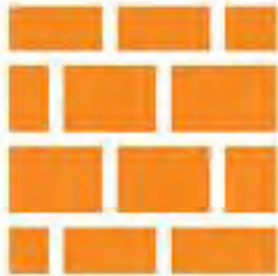
NPS UNIFORM COLLECTION
HARPERS FERRY, WEST VIRGINIA



FIT AND PERCEPTION TESTS

DESIGN EXPLORATION: MATERIALS

ABRASION RESISTANT



BREATHABLE



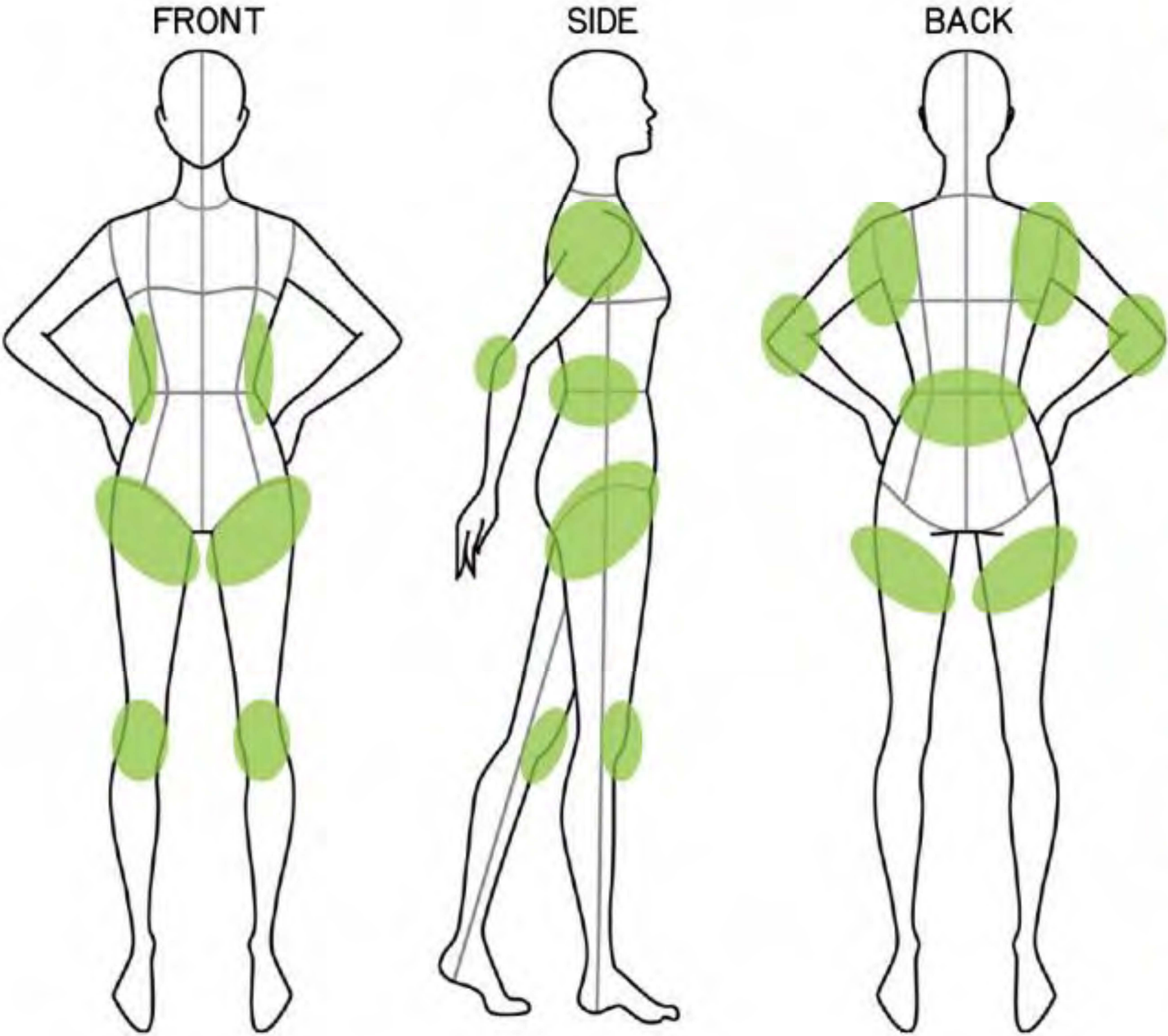
WATERPROOF



4-WAY STRETCH



DESIGN EXPLORATION: STRETCH / MOBILITY



DESIGN EXPLORATION: STORAGE

BACK OR SIDE POCKETS



This panel illustrates items that can be stored in back or side pockets. It features a smartphone with a red home screen, a brown leather wallet containing a credit card and a pen, and a stack of colorful sticky notes in yellow, pink, and blue.

POCKET OR CLIPPED TO BELT



This panel illustrates items that can be stored in a pocket or clipped to a belt. It shows a single black walkie-talkie with a screen and a keypad, and two black walkie-talkies with antennas and side buttons.

CLIPPED TO BELT



This panel illustrates items that can be clipped to a belt. It features a red spray can labeled 'SABRE WILD MAX', a blue carabiner with a set of keys, and a blue rescue key with a red tag and the text 'REScue KEY'.

DESIGN EXPLORATION: HISTORY / APPEARANCE



DON'T MESS WITH THE HAT

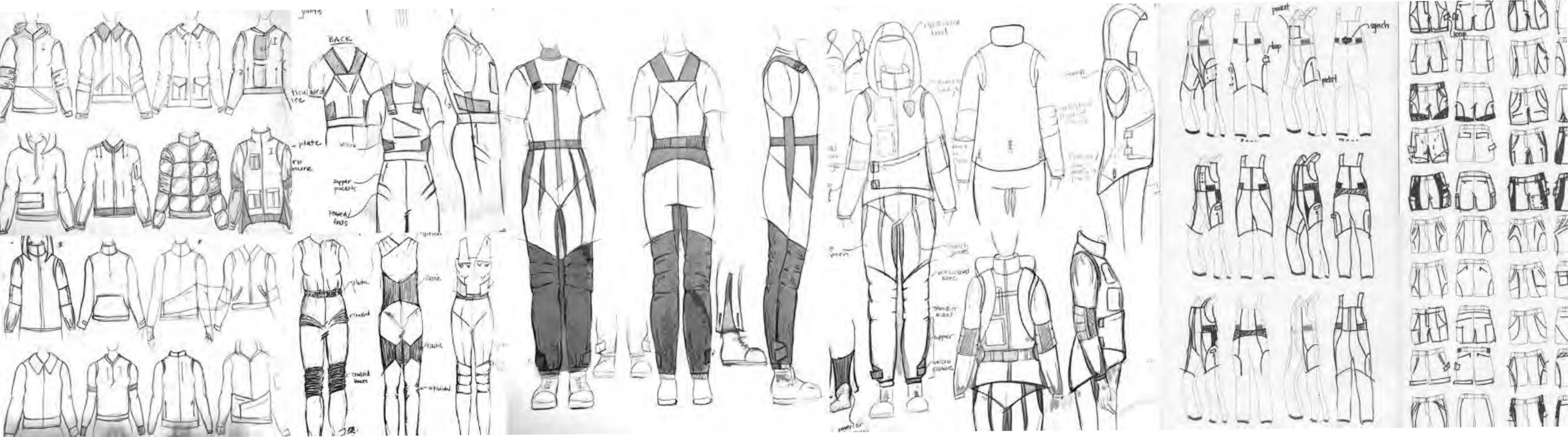


ICONIC COLOR SCHEME



MUST EXUDE AUTHORITY

DESIGN EXPLORATION: IDEATION



PROOF OF CONCEPT



Each piece in the TRAILBLAZER RANGER COLLECTION is designed specific to the needs of the U.S. National Park Service female rangers. Female-specific fit, body contouring stretch panels and waterproof and breathable materials are all used strategically to provide the most comfort without compromising movement, function, professional appearance and the historical color scheme that is synonymous with the U.S. National Park Rangers.

PARTS AND PURPOSE: BETTY RAIN JACKET AND CLAIRE WORKSHIRT

LIGHTWEIGHT,
WATERPROOF MATERIALS



3/4 FAUX FRONT PLACKET



FRONT AND BACK
STORAGE OPTIONS

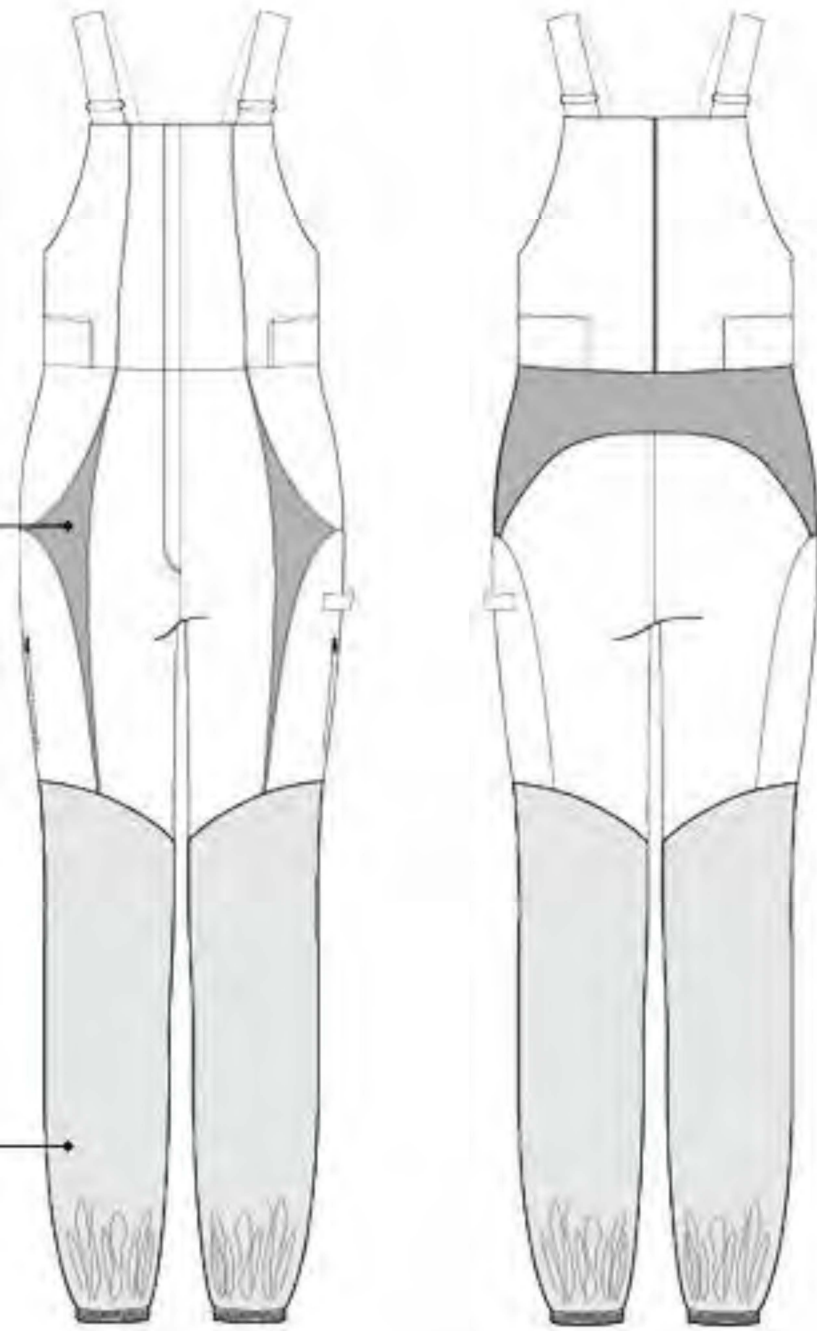


GUSSETS AT SHOULDERS

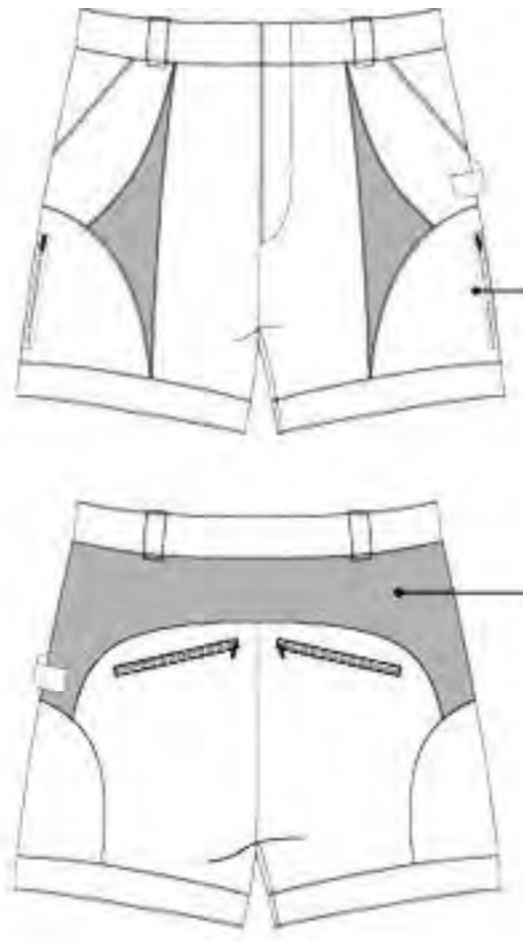


PARTS AND PURPOSE: POLLY HIKING OVERALLS AND FRAN CARGO SHORTS

BODY CONTOURING PANELS



SECURE POCKETS



WATERPROOF AND ABRASION RESISTANT



STRETCH PANELS



PROTOTYPES: POLLY HIKING OVERALLS



PROTOTYPES: BETTY RAIN JACKET



PROTOTYPES: FRAN CARGO SHORTS



PROTOTYPES: CLAIRE WORKSHIRT



VALIDATION: PERCEPTION TEST

1ST PERCEPTION TEST WITH ANDREA WILLINGHAM

FORMER U.S. NATIONAL PARK RANGER

"I think it's a great improvement. I think its both modernizing it but its also keeping it true to the aesthetic that most people know."

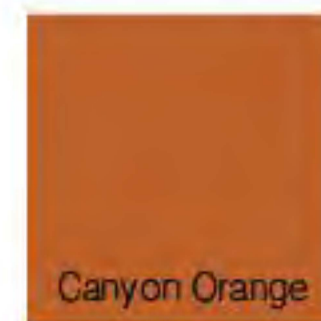
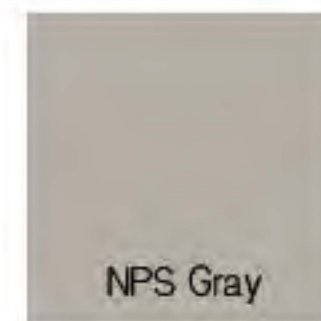
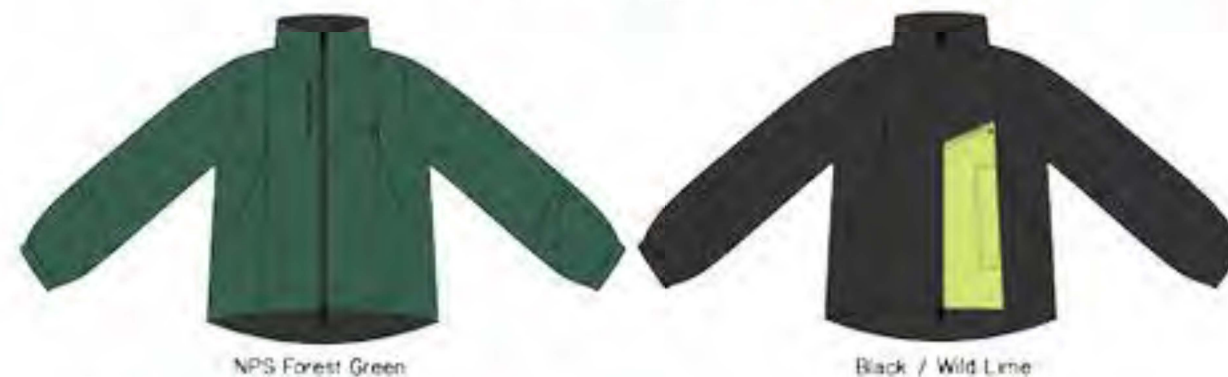


FINAL COLLECTION





TRAILBLAZER
RANGER COLLECTION



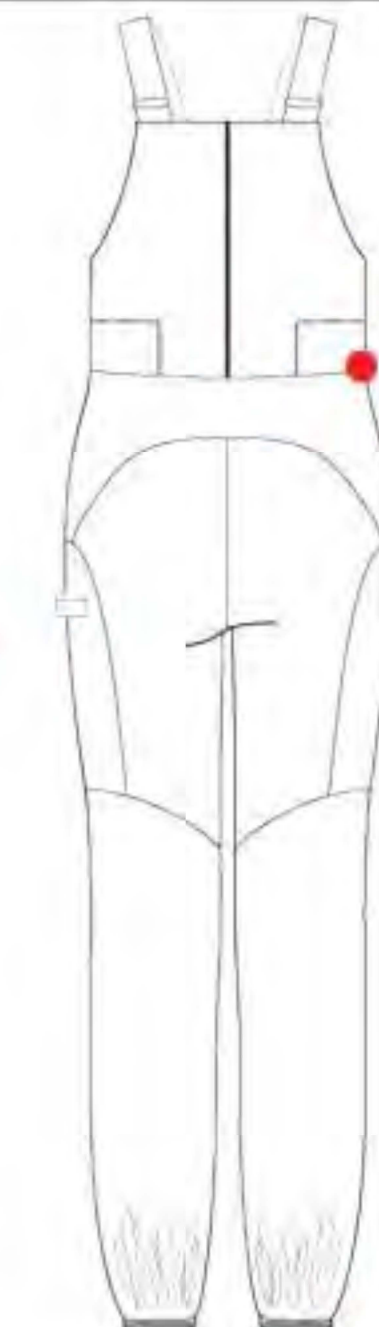
● INTERIOR / COLLAR TAGS



● BUTTONS / SNAPS



● EXTERIOR POCKET TAGS







RANGER COLLECTION: BETTY RAIN JACKET

COLOR:

NPS GREEN/
BLACK/WILD LIME

BLACK/WILD LIME

NPS GREEN



SIZE:

[SIZE CHART](#)

XXS

XS

S

M

L

XL

XXL

QUANTITY:

◀ 1 ▶

ADD TO CART

TRAILBLAZER TALE:



BETTY REID SOSKIN

[LEARN MORE](#)

“I REALLY LIKE THE GUSSETS. THEY WOULD MAKE A BIG DIFFERENCE IF YOU’RE OUT IN THE FIELD AND YOU’RE REACHING AND BENDING AND LIFTING.”

-NANCY RUSSELL





“THE STYLE IS SUCH AN IMPROVEMENT OVER THE SHORTS THAT THEY HAVE. I LIKE THAT THEY ARE HIGH WAISTED SO IT CAN BE FLATTERING TO MANY DIFFERENT BODY TYPES.”

-ANDREA WILLINGHAM





“FOR FIELD WORK IT’S NICE TO HAVE ZIPPERS...SO YOU DON’T GET BACK TO THE CAR AND WONDER WHERE YOUR CAR KEYS ARE.”

-NANCY RUSSELL



I LIKE THE STYLE. I'D SUPER WEAR THE HECK OUT OF THAT.

- ANDREA WILLINGHAM



The TRAILBLAZER Ranger Collection balances history and innovation. Each piece in the collection honors the legacy of the US National Park Service while taking advantage of newer technologies and functional design. The collection provides a solution unique to the daily responsibilities of the female NPS rangers.

THANK YOU

Charity Fox
Senior Technical Designer - Outerwear
Outdoor Research

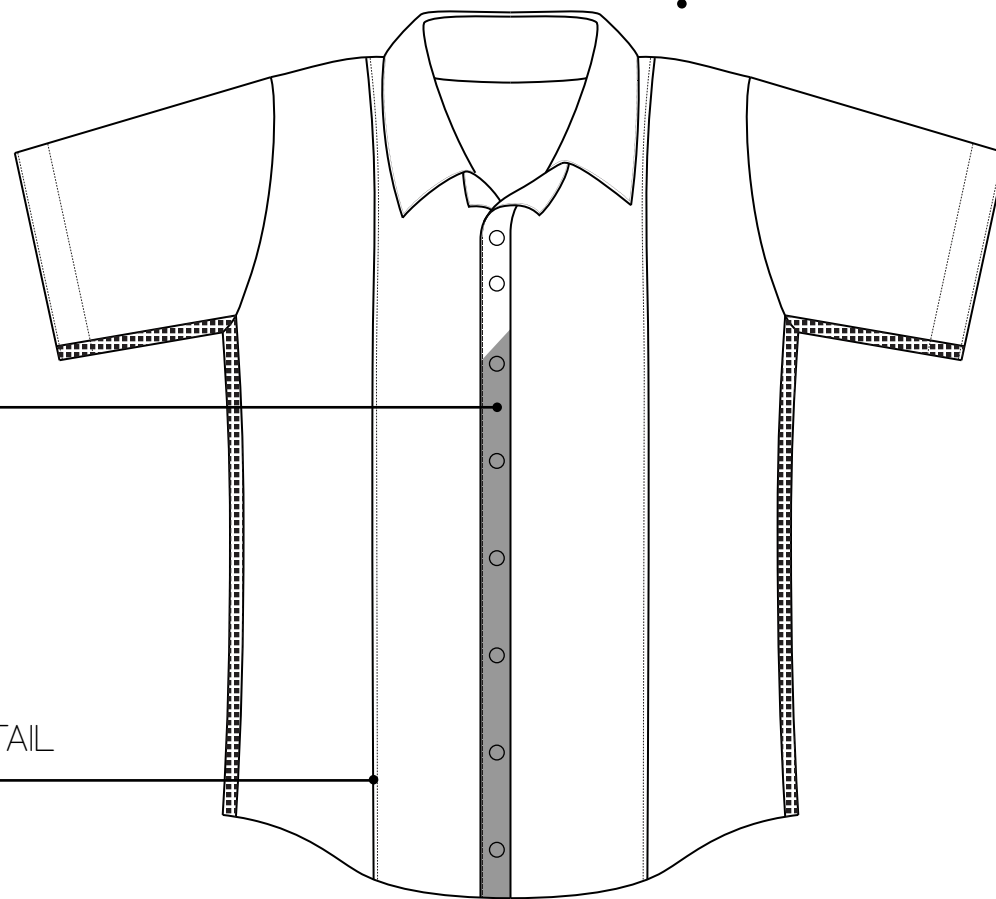
Andrea Willington
Former National Park Service Ranger

Nancy Russell
Archivist - NPS History Collection
National Park Service



Tech Drawings / Branding
Dated 6-4-2020

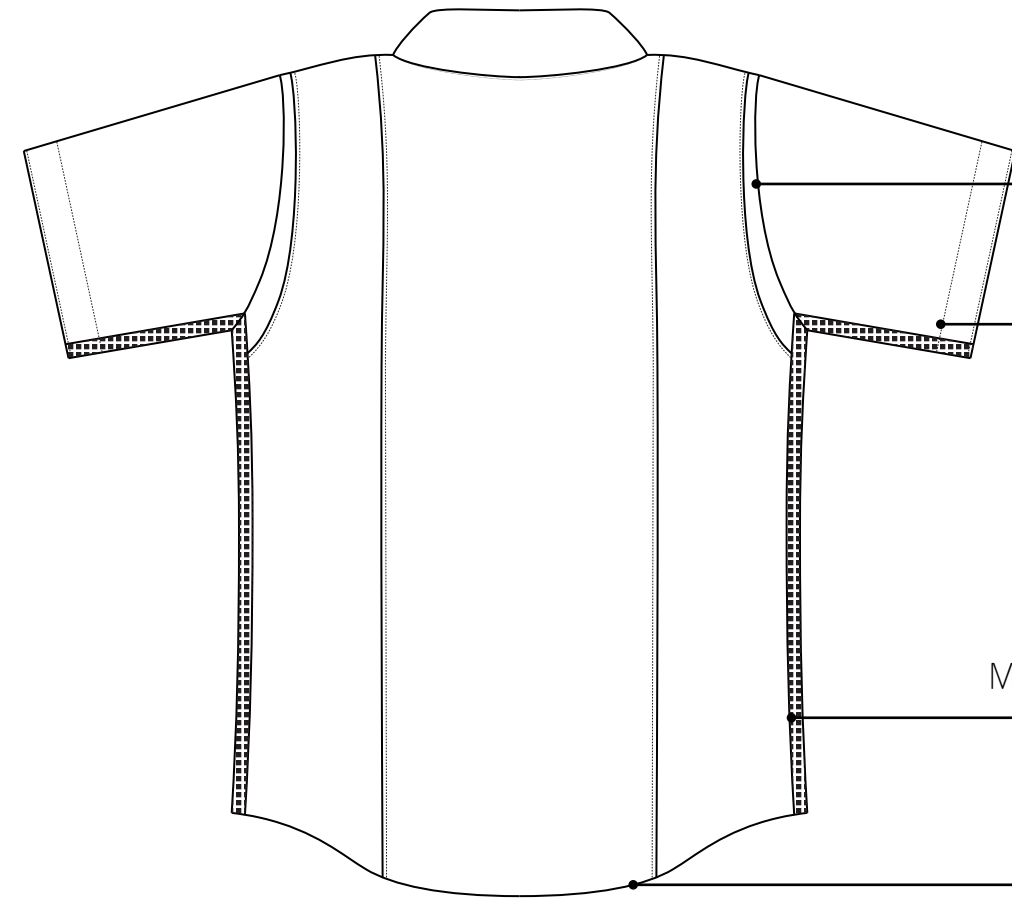
FRONT



3/4 FAUX FRONT PLACKET

SEAM WITH TOP-STITCH DETAIL

BACK



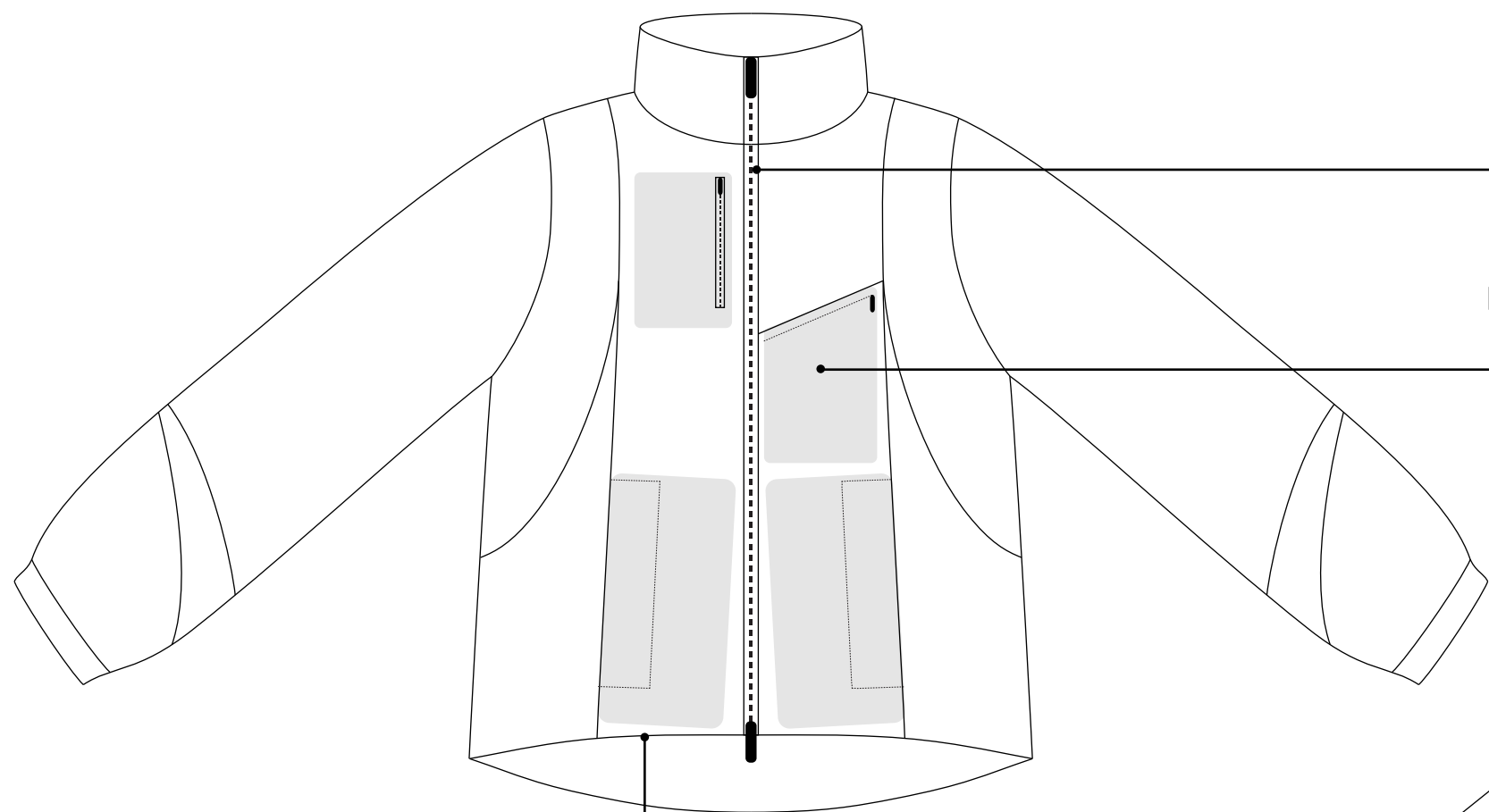
SHOULDER GUSSETS

1" HEM WITH TOP STITCH

MESH SIDE / UNDERARM PANELS

1/2" HEM WITH TOPSTITCH

FRONT



2 WAY SEPARATING ZIPPER

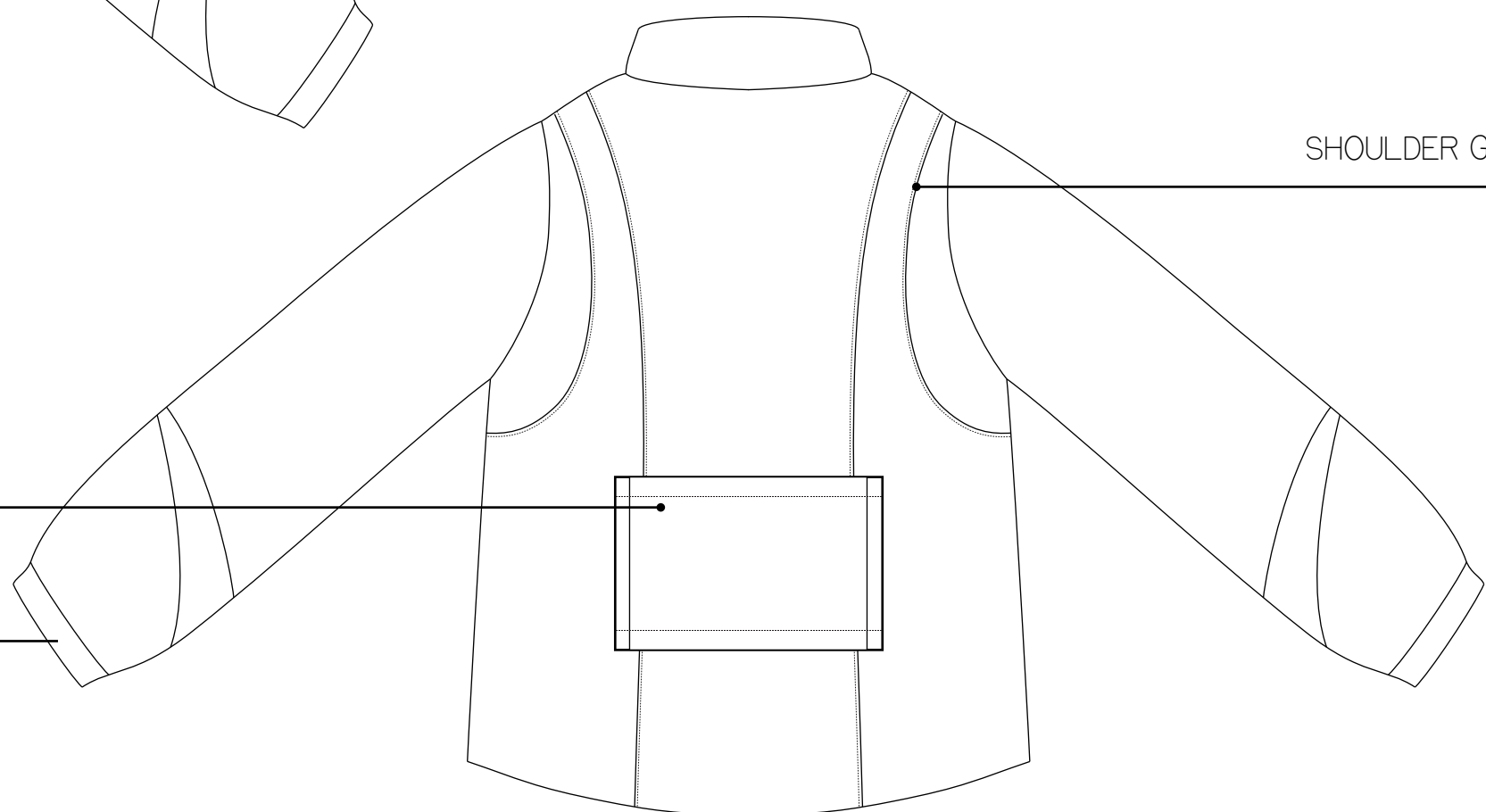
FRONT HIDDEN POCKETS WITH ZIPPER CLOSURES (TYP 4)

SHORTENED FRONT HEM

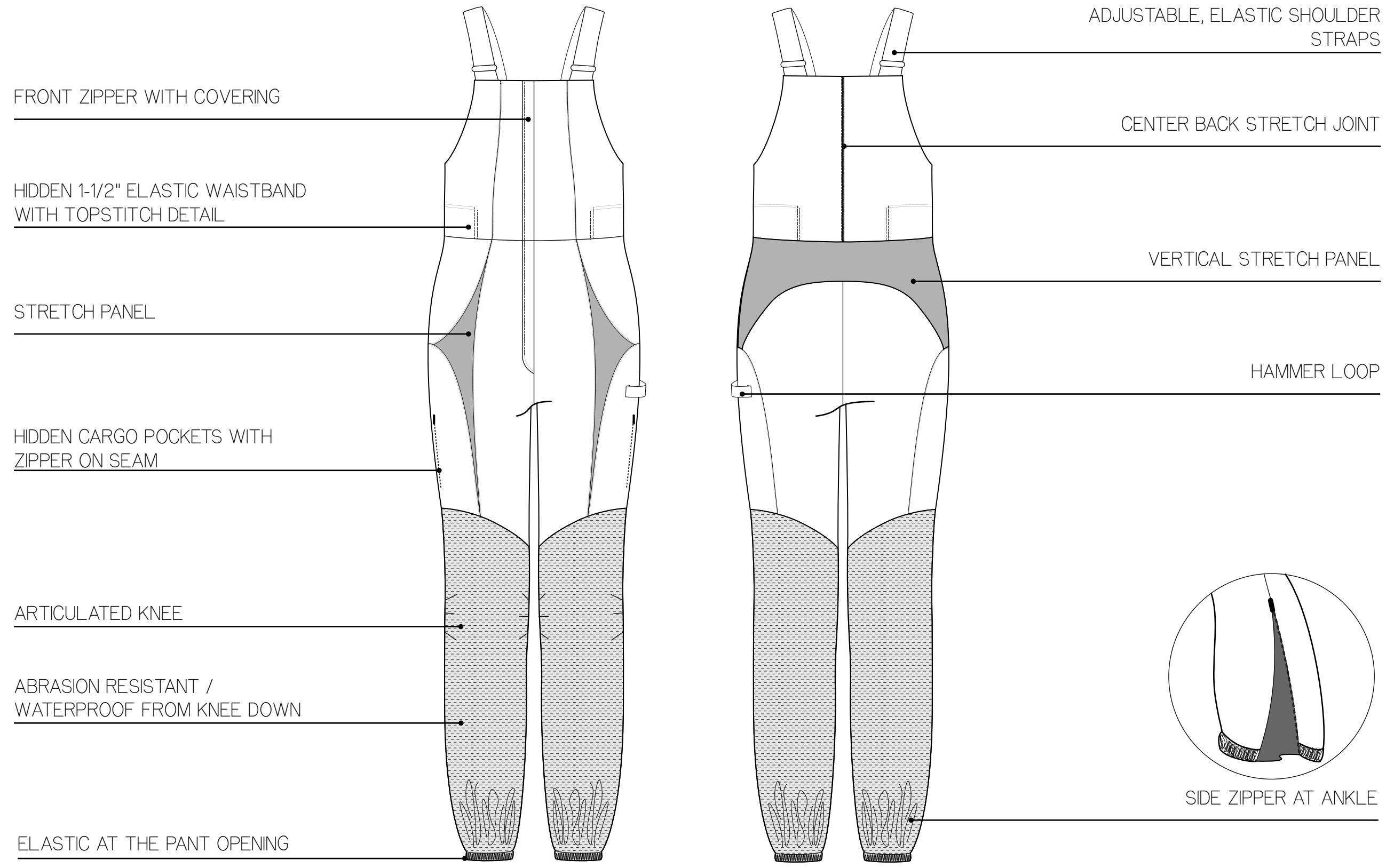
BACK POCKET WITH VELCRO CLOSURES

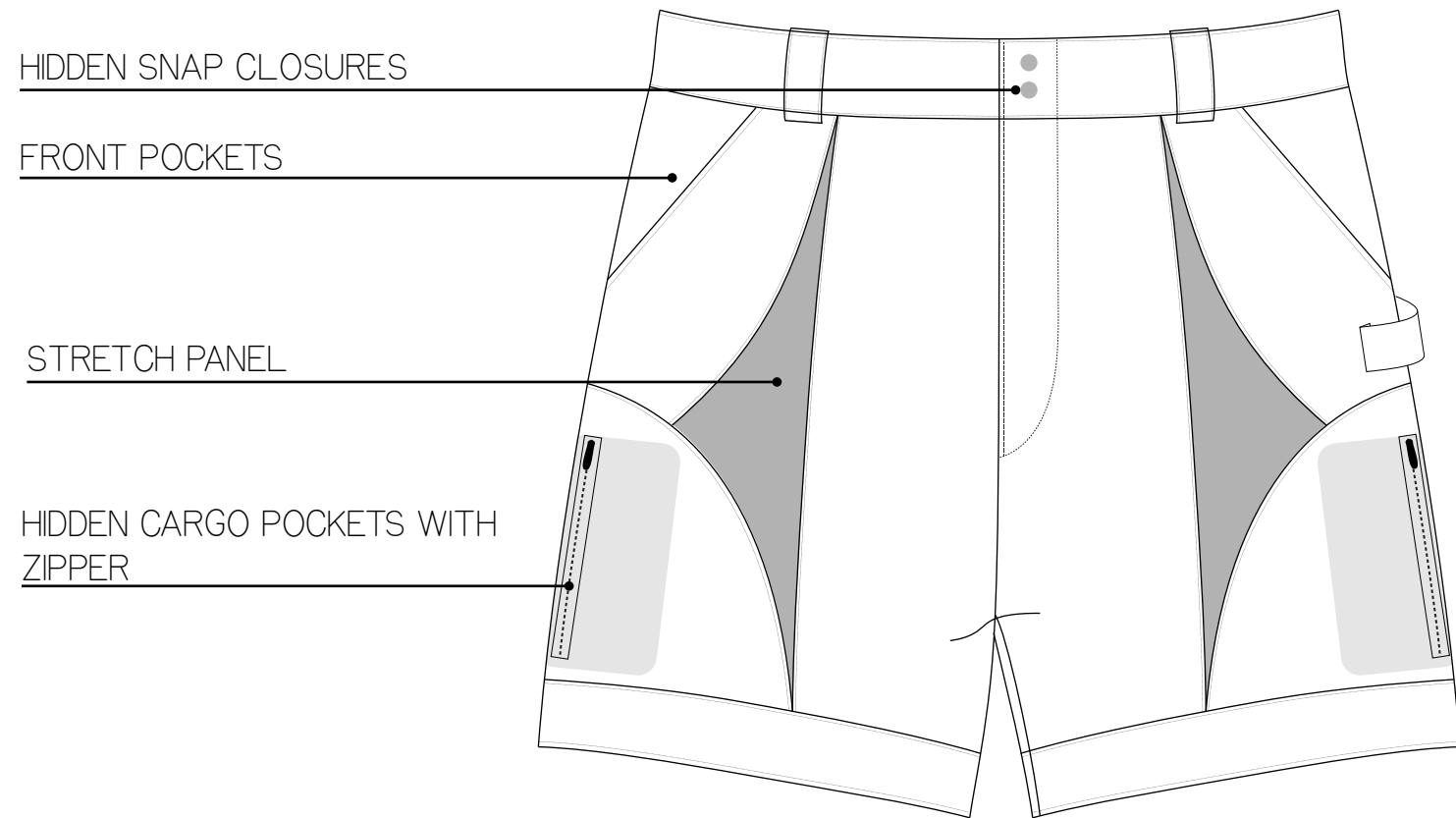
ELASTIC AT SLEEVE OPENING

BACK



SHOULDER GUSSET



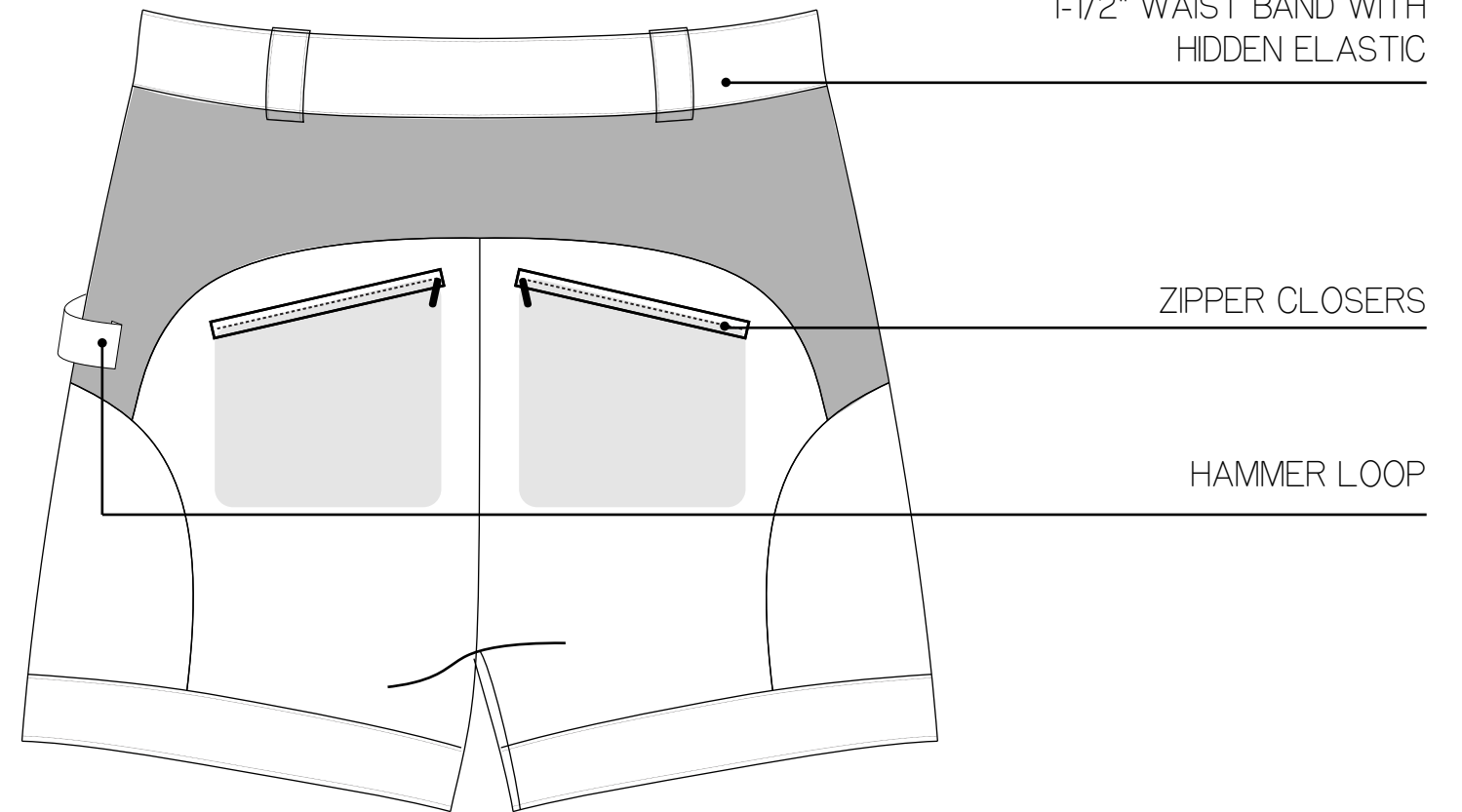


HIDDEN SNAP CLOSURES

FRONT POCKETS

STRETCH PANEL

HIDDEN CARGO POCKETS WITH ZIPPER



1-1/2" WAIST BAND WITH HIDDEN ELASTIC

ZIPPER CLOSERS

HAMMER LOOP

FRONT ZIPPER

Front zipper allows for easy on-off

ELASTIC WAIST

Elastic panels continuing from front to back create a fitted waist without too-tight, pinching.

4 WAY STRETCH PANELS

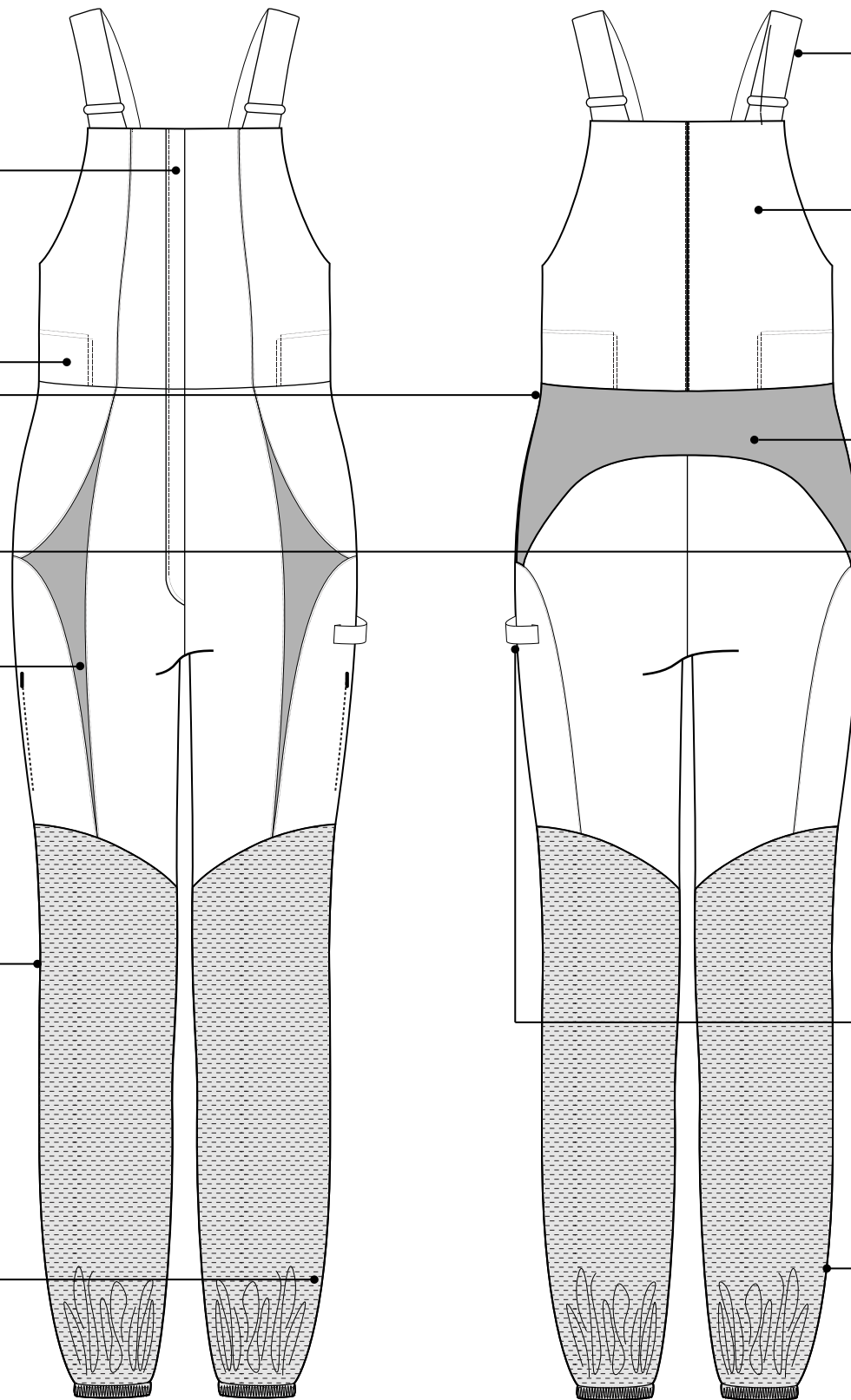
Body contouring panels that move and stretch naturally with the female figure.

ARTICULATED KNEE

Additional fabric at need to allow for easy movement

ANKLE ZIPPERS

Easy on-off with ankle zippers; fitted at the bottom and can be worn over boots



ELASTIC SHOULDER STRAPS

Adjustable, elastic straps that moves with the body

HORIZONTAL STRETCH

Stretch joint allows for additional movement and comfort across back

VERTICAL STRETCH

Stretch panel at back yoke gives additional stretch when bending and sitting

CARPENTER LOOPS

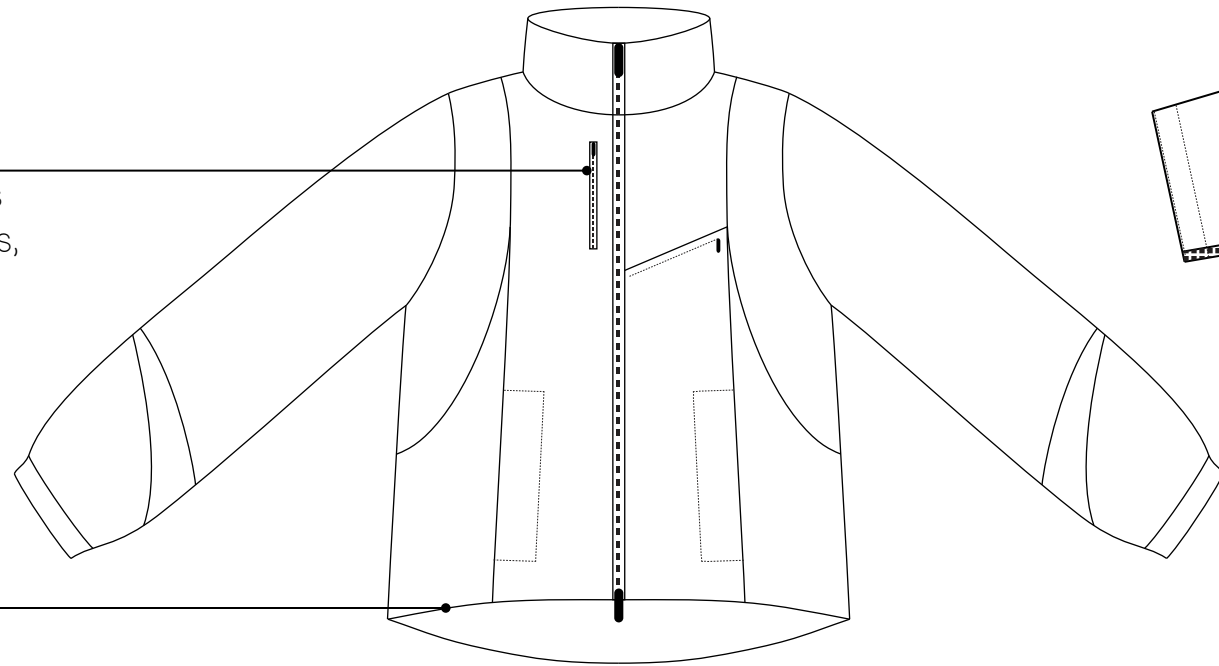
Loops for clip-on storage.

ABRASION RESISTANT MATERIAL

Knee-down waterproof, abrasion resistant material providing protection for trekking through the backcountry.

STORAGE

Multiple zippered pocket options to keep phone, keys, note cards, emergency items, etc. secure

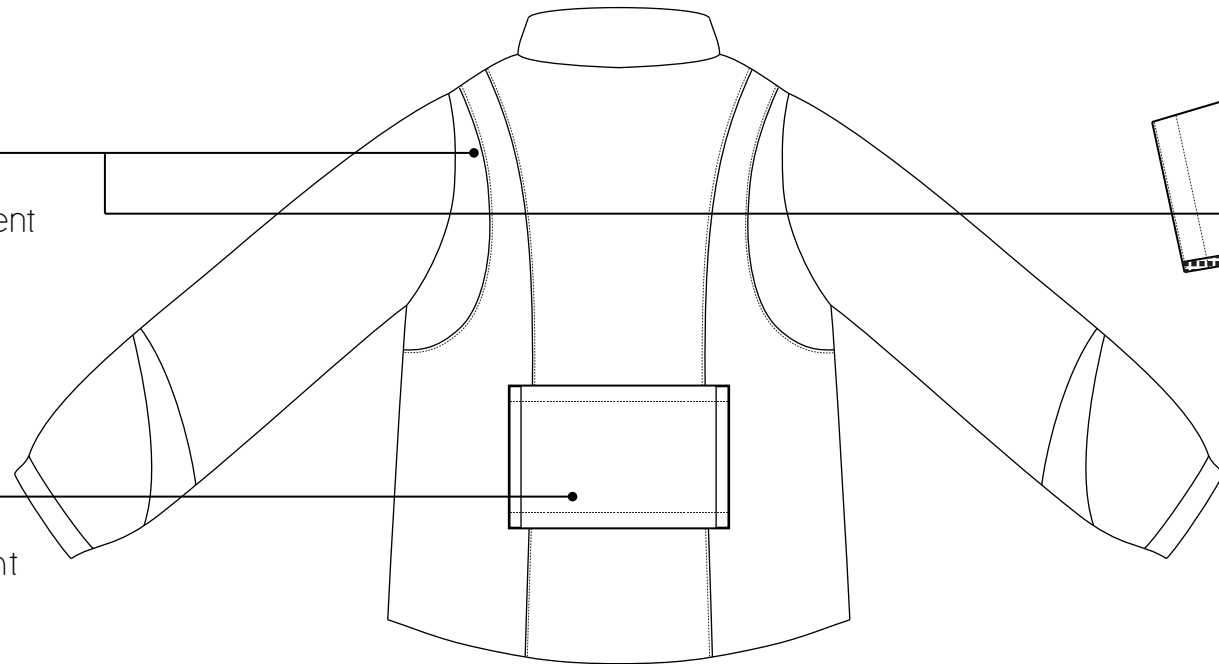


HIGH-LOW DESIGN

High - low hem provides less restricted movement in front

SHOULDER GUSSETS

Gussets at shoulder give extra room for less restricted movement

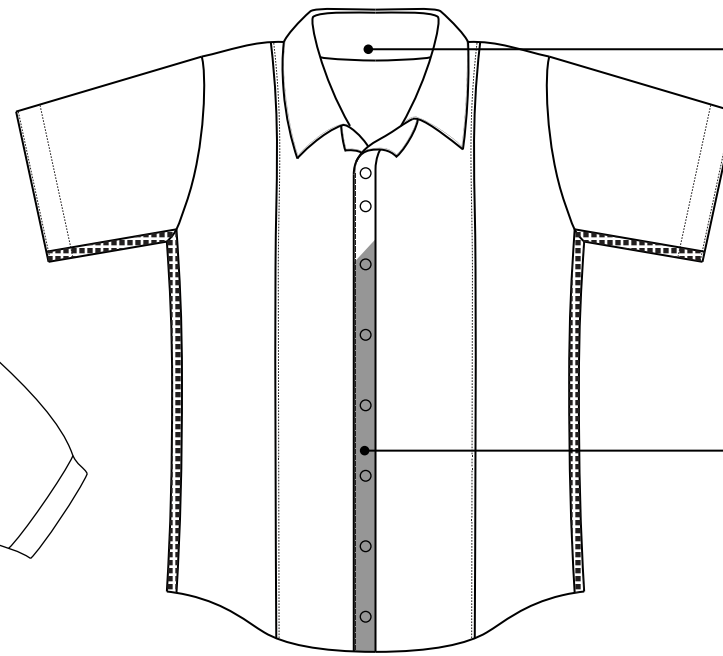


BACK POCKET

Easy access storage for larger items such as notepads, flashlight or emergency items

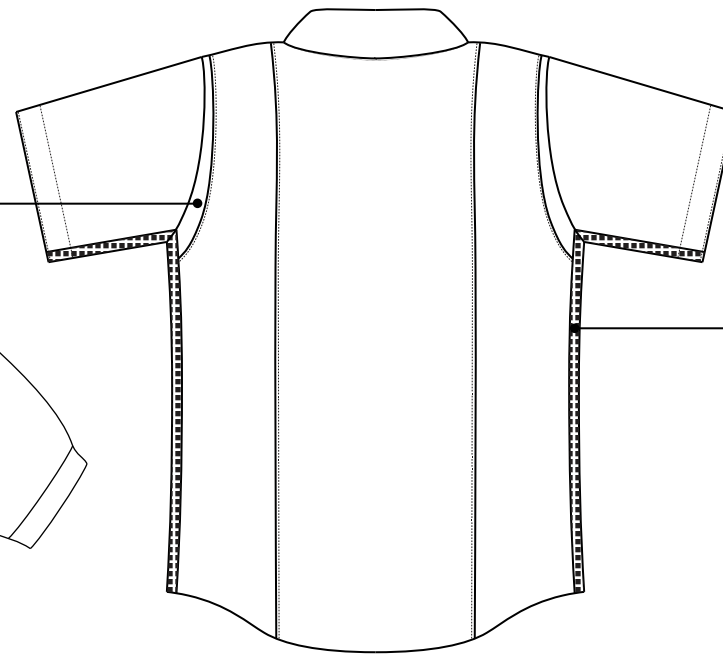
MOISTURE WICKING

Moisture wicking material at interior of collar keeps back of neck dry and cool



3/4 FAUX FRONT PLACKET

Faux placket provides a classic professional look without the common issues of buttons popping open, gaps and odd stretching. The top two buttons remain functional.

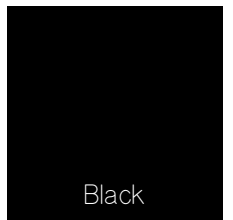
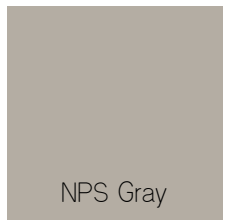
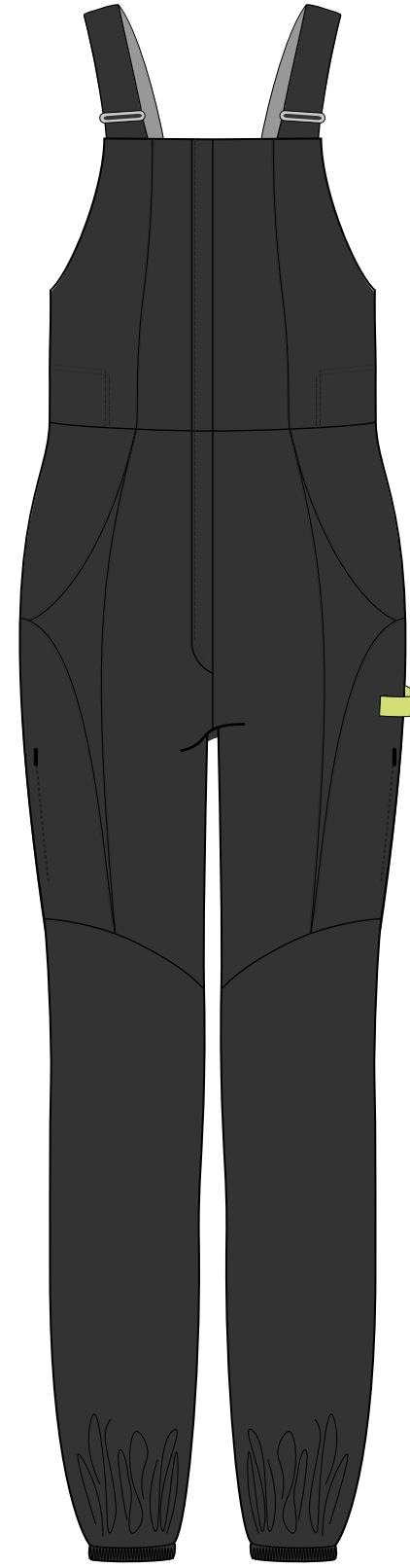
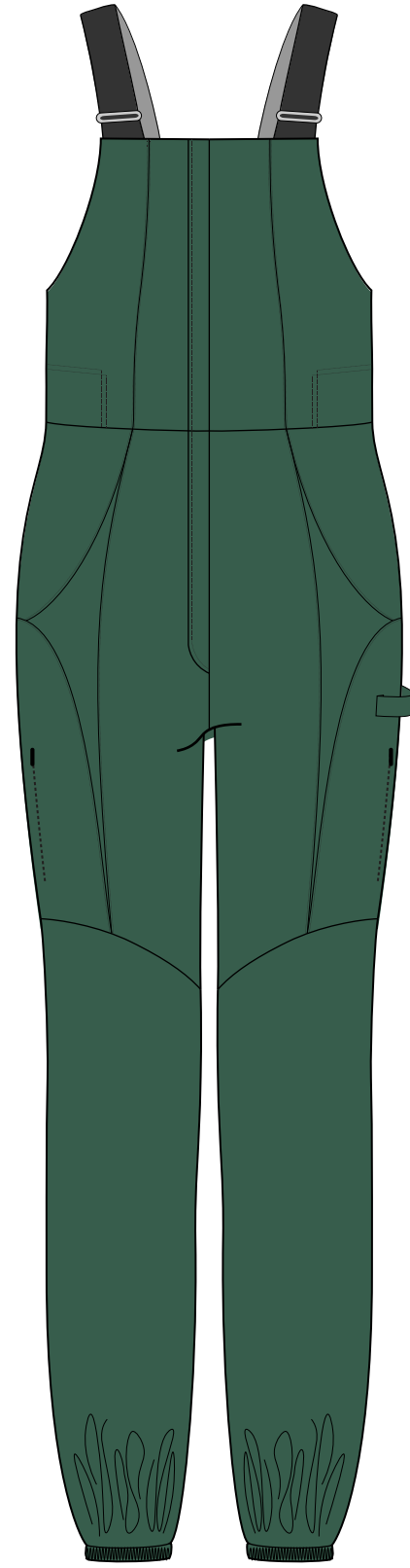
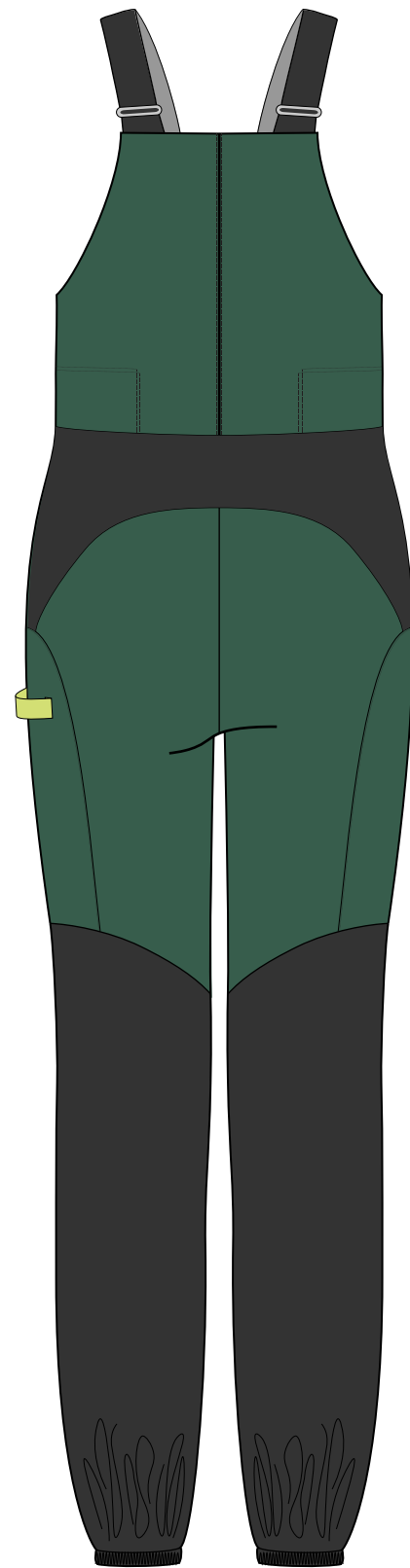
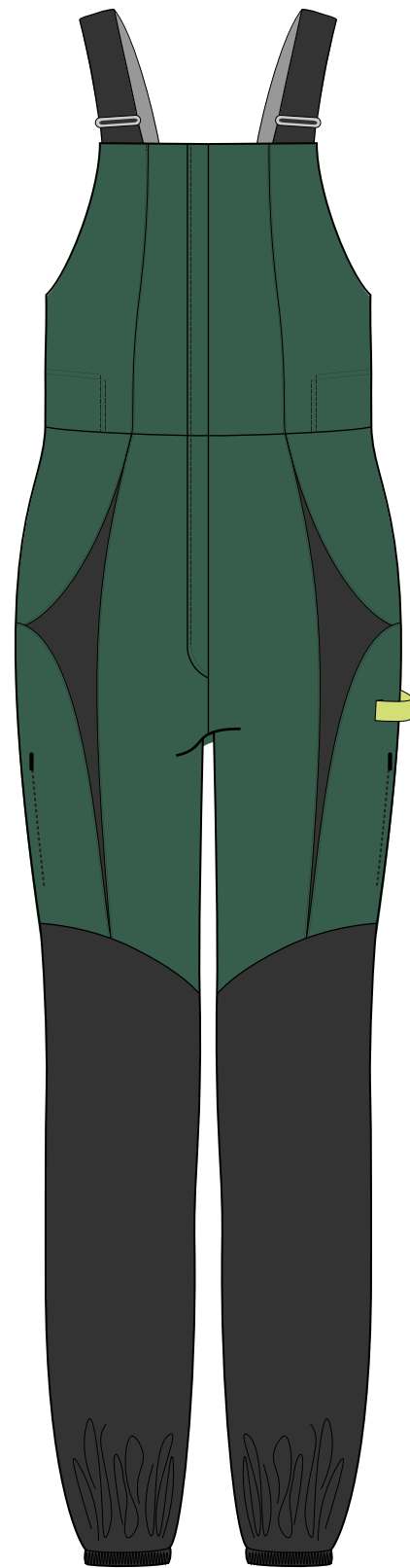


DOUBLE LAYER MESH

Double layer of mesh at sides and underarms stretches and allows airflow to keep cool

FRONT

BACK



NPS Forest Green / Black / Wild Lime

NPS Forest Green

Black / Wild Lime

FRONT



BACK



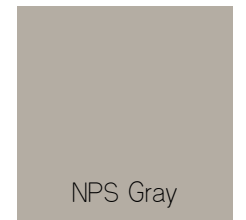
NPS Forest Green / Black / Wild Lime



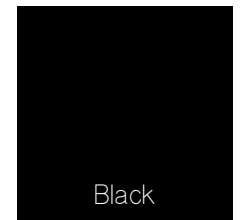
NPS Forest Green



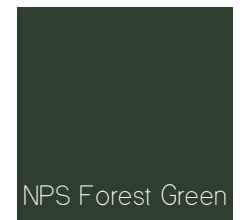
Black / Wild Lime



NPS Gray



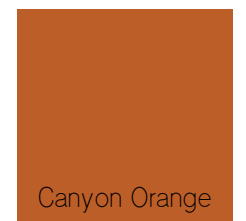
Black



NPS Forest Green



Wild Lime

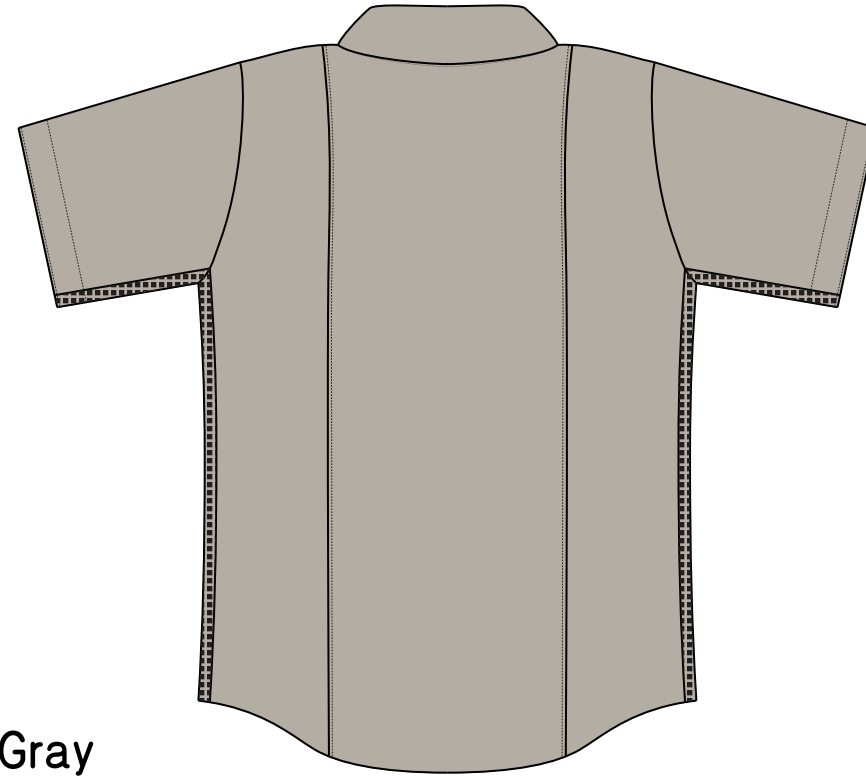


Canyon Orange

FRONT



BACK



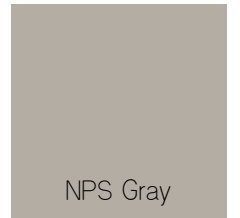
NPS Gray



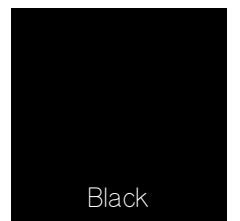
Canyon Orange



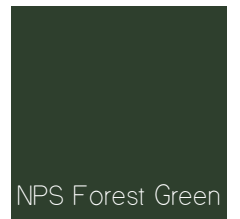
Wild Lime



NPS Gray



Black



NPS Forest Green



Wild Lime



Canyon Orange

FRONT



NPS Forest Green / Black / Wild Lime

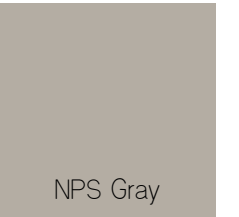
BACK



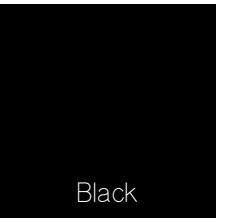
NPS Forest Green



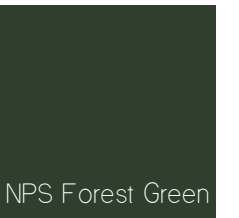
Black / Wild Lime



NPS Gray



Black



NPS Forest Green

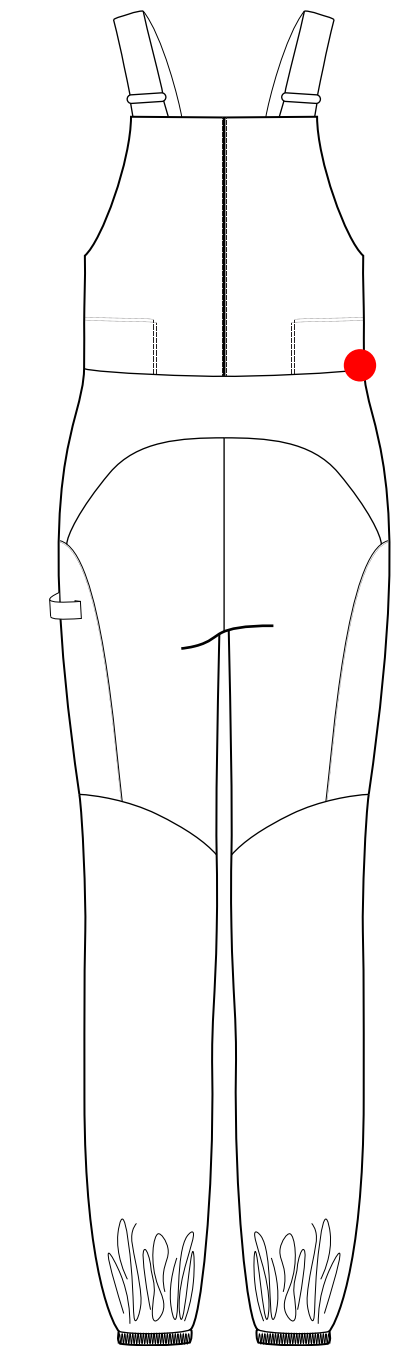
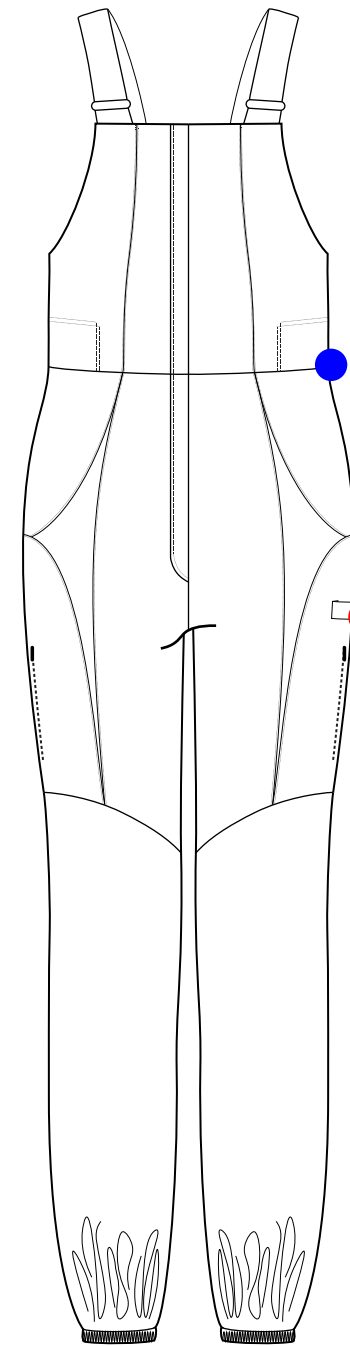
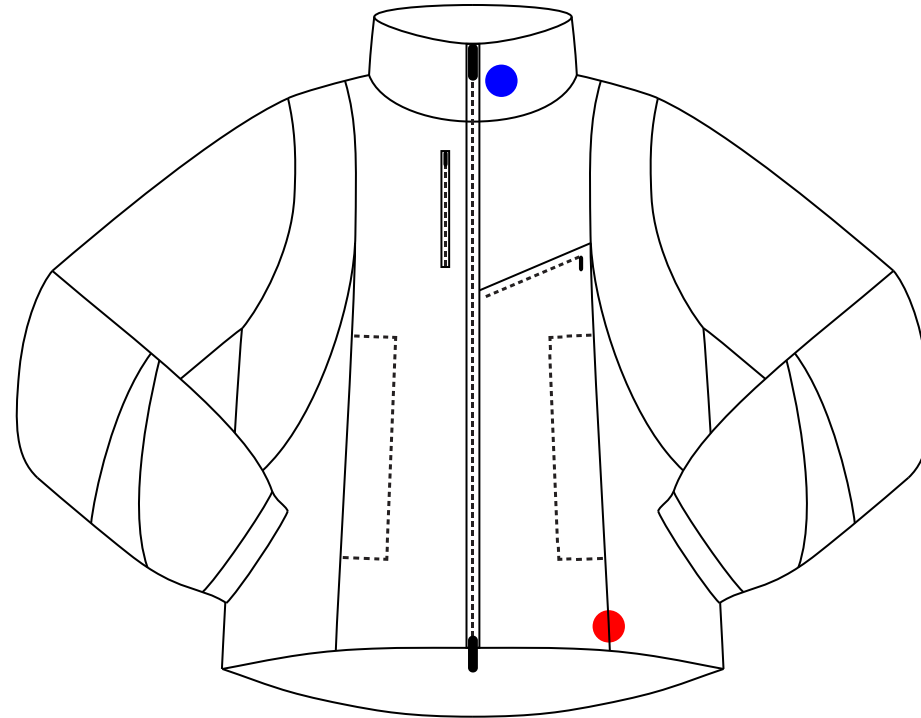
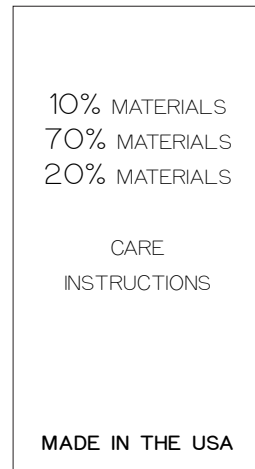
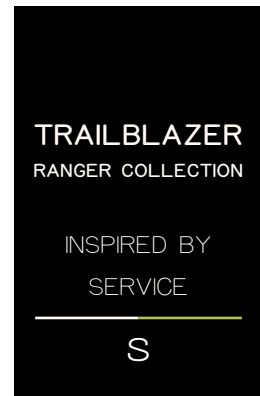


Wild Lime

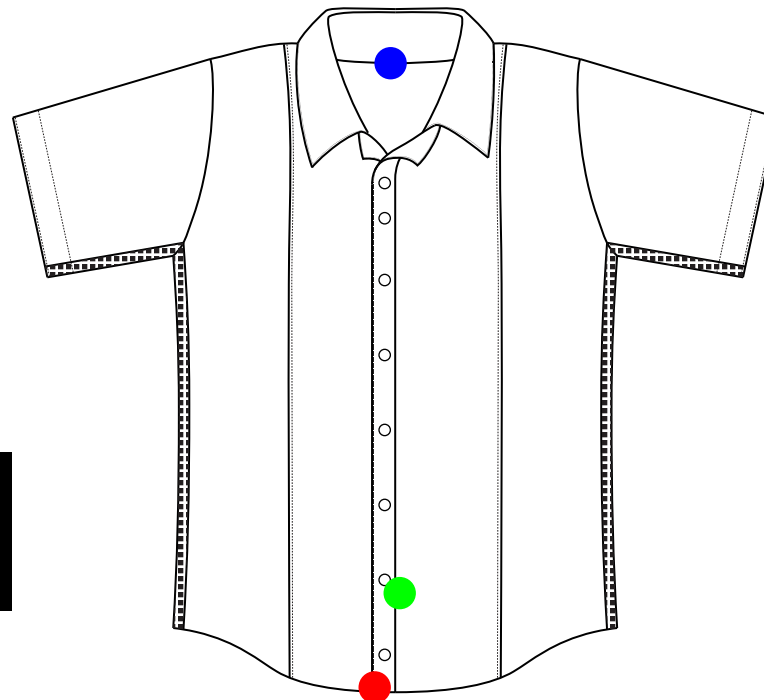
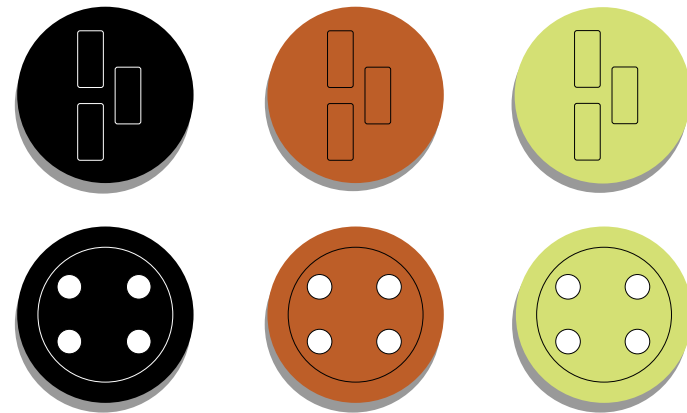


Canyon Orange

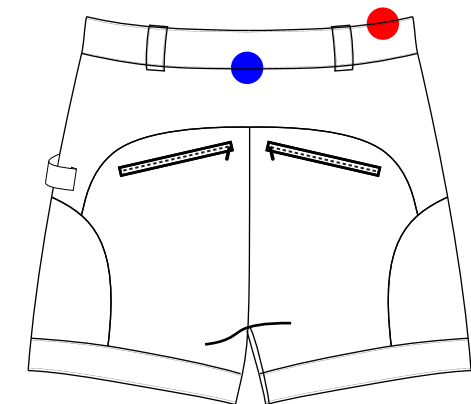
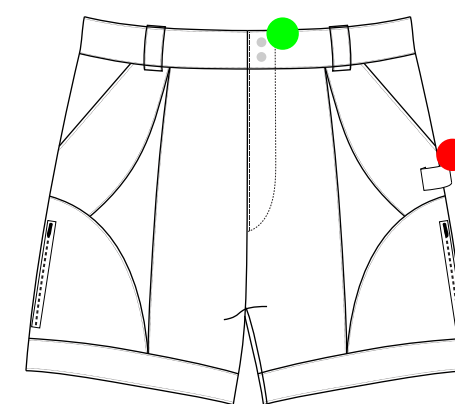
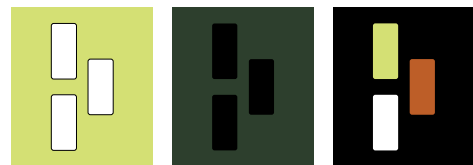
● INTERIOR / COLLAR TAGS



● BUTTONS / SNAPS



● EXTERIOR POCKET TAGS



Front

Back

Fold Example



CLAIRE MARIE HODGES
1918

FIRST FEMALE U.S.
NATIONAL PARK RANGER



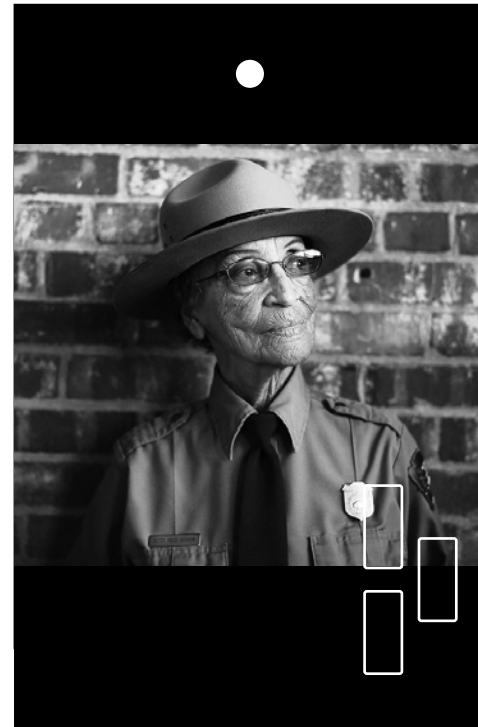
POLLY MEAD PATRAW
c.1931

FIRST FEMALE PARK
RANGER AT GRAND CANYON
NATIONAL PARK



FRAN P. MAINELLA
2001

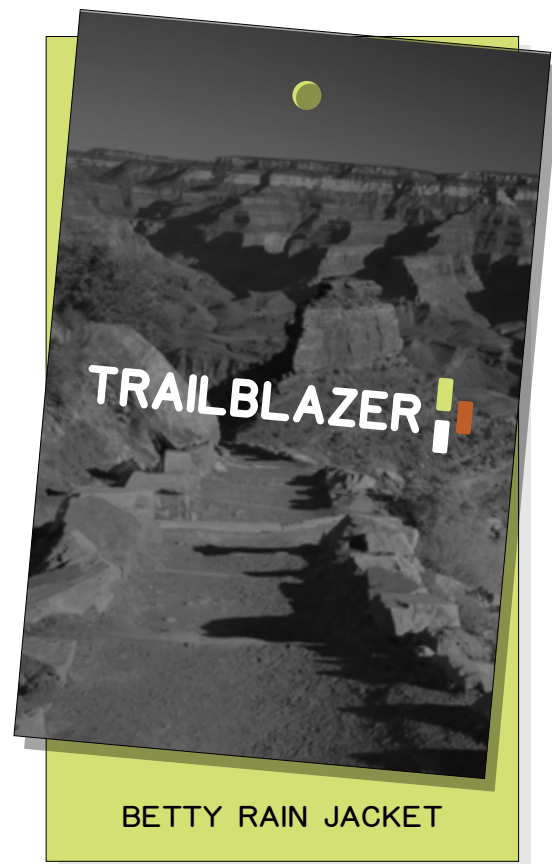
FIRST FEMALE DIRECTOR OF
THE U.S. NATIONAL PARK
SERVICE



BETTY REID SOSKIN
2020

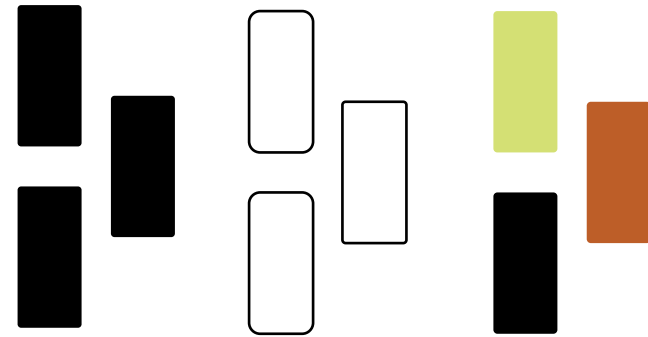
OLDEST ACTIVE U.S.
NATIONAL PARK RANGER
ROSIE THE RIVETER WWII
HOME FRONT PARK





TRAILBLAZER 

TRAILBLAZER 



TRAILBLAZER 
RANGER COLLECTION 

TRAILBLAZER 
RANGER COLLECTION 



National Park Outline

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

National Park Heavy

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

National Park Regular

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

National Park Thin

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

1 2 3 4 5 6 7 8 9 0

TRAILBLAZER 
RANGER COLLECTION 

NAME TRAILBLAZER COLLECTION

DATE JUNE 4, 2020

DESCRIPTION FONTS AND LOGOS

DESIGNED BY JN