

# A Unigrid Brochure for Low-Vision Users

*C&O Canal and Harpers Ferry Center Team Up to Develop Innovative Brochure*

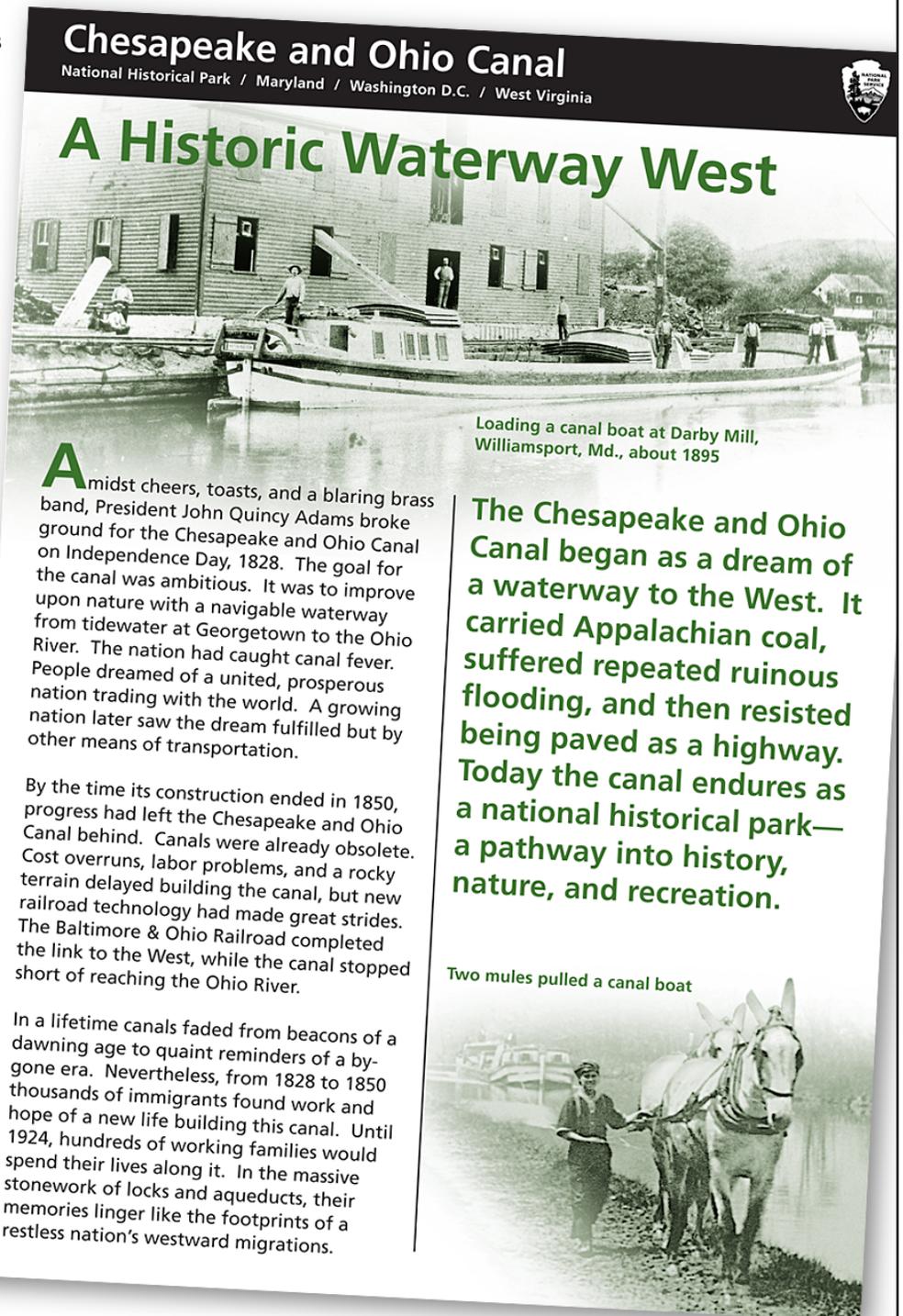
**Marsha Mazz of the U.S. Access Board is used to getting large-print photocopied text versions of park brochures when she visits her favorite national parks. Mazz suffers from macular degeneration, a condition predominantly found in elderly adults. The condition severely restricts her ability to see fine details and to read standard size print.**

## Photocopies Just Don't Do the Job

The park photocopies she often receives have been copied or re-copied so many times that the text is rarely sharp and the contrast is usually poor. The text typically comprises just a brief synopsis of a park's official Unigrid brochure, and usually hasn't been kept up to date like the standard brochure. Photographs, which Mazz has a much easier time seeing and comprehending, are almost never included.

So when Mazz was handed a copy of the C&O Canal's new large print Unigrid park brochure, she couldn't believe her eyes. The 17½ point type was easy to read. The text provided a perfect mix of historical interpretation, points of interest, and safety information. Photographs complemented the text, and a drawing even showed how a lock gate works. More surprising was a large-print full-color map that allowed her to identify where she was and how her location related to the rest of the 185-mile-long canal.

"I don't even need my magnifier," she said with a broad grin, explaining that having her hands free to handle, fold, and maneuver the brochure made it much more usable. She then bent the brochure toward the overhead light. "And you used dull coated paper!" Glare from glossy coated paper can be very distracting for low-vision readers.





*C&O Canal chief of interpretation Bill Justice talks about the park's large print brochure during the accessibility workshop in Shepherdstown, West Virginia. (NPS Photo by David T. Gilbert)*

### C&O Canal Takes the Lead

Bill Justice, Chief of Interpretation at Chesapeake & Ohio Canal National Historical Park, couldn't have been more pleased. Bill's passion for accessibility dates back to the 1980s, when he installed a captioning system for the film at Fort McHenry. In August 2002, he approached Harpers Ferry Center to help create a large-print version of the C&O Canal's Unigridd brochure. But as staff from the park and HFC worked through the brochure's many challenges, the project evolved into something much more.

To understand more fully the needs of the various users with low vision disabilities, the project members assembled a multi-disciplinary team of National Park Service staff, graphic design contractors, and national experts in low-vision print media. The project members also realized that the learning process guiding the design and development of the C&O Canal large print brochure should be applied to a Unigridd-style template that could be used to meet the needs of low-vision park visitors Servicewide.

### Large Print Guidelines & Experts

The brochure team first reviewed guidelines from organizations that have established standards for materials printed for people with low vision (*see Bibliography of Standards on page 11*). For instance, in their "Guidelines for Optimal Readability," the American Printing House for the Blind (APH) recommends that the beginning of each paragraph be separated from the previous paragraph by an extra line space instead of a paragraph indent. APH stresses several other guidelines:

- type size should be at least 18 point
- leading or line spacing should be at least 125% of the line height
- headings and subheads should be larger and bolder than regular text
- columns and divided (e.g. hyphenated) words should be avoided
- paragraphs should be block style with one-inch margins
- left margins should be justified and right margins should be ragged
- text should appear black on white, ivory, cream or yellow paper with a dull finish

### Large Print Brochure Receives Accessibility Achievement Award

C&O Canal National Historical Park and Harpers Ferry Center received a 2007 NPS National Accessibility Achievement Award for Programmatic Accessibility for the "development of a brochure suitable for low-vision users that can be adapted by other parks."

### Large Print Brochure Team

#### Chesapeake & Ohio Canal NHP

- Bill Justice  
Chief of Interpretation
- Geoffrey Suiter  
Park Ranger

#### Harpers Ferry Center

- Melissa Cronyn  
Associate Manager for Publications
- Magaly Green  
HFC Accessibility Coordinator
- Linda Meyers  
Printing and Production Officer
- Mark Muse  
Prepress Specialist
- Lori Simmons  
Cartographer
- Ed Zahniser  
Editor

#### Reviewers

- Dr. Aries Arditi  
Lighthouse International
- Ray Bloomer  
National Center on Accessibility, Indiana University
- Elaine Kitchel  
The American Printing House for the Blind (APH)
- Phil Maggio  
Library of Congress, Division of the Library of the Blind
- Jan Majewski  
Department of Justice
- Dr. Lorraine Marchi  
National Association of the Visually Handicapped (NAVH)
- Susan Ostby  
National Center on Accessibility (NCA)
- Ike Presley  
American Foundation for the Blind (AFB)

#### Design Contractor

- Kirilloff Design

- text should *not* appear over a background photo, artwork or other graphical material
- large print users should have access to graphics that are not only enlarged, but maintain the same contrast, clarity, and appropriate coloration as those prepared for sighted users

In “Large Print Publications,” the National Association for the Visually Handicapped (NAVH) recommends that whenever columns of text do appear on a page, a vertical line be used to separate these columns. Because many people with low-vision hold reading material very close to their eyes—seeing only a very small segment of a page at a time—virtually all the guidelines stress the use of visual clues in the page design to help low-vision readers find their way across the page.

The team also consulted accessibility experts in the field of large print media (*for a complete list of these experts, see Large Print Brochure Team on page 10*). They had a number of fruitful discussions with Ray Bloomer of the National Center on Accessibility at Indiana University. Dr. Aries Arditi of Lighthouse International and Elaine Kitchel of The American Printing House for the Blind (APH) reviewed brochure and map mockups. These low-vision experts provided great professional advice as well as a window into the realities of being visually impaired.

### Providing an Equivalent Experience

Bill Justice recognized early on that it was important to create the large print brochure from scratch. “We didn’t want to impose our current Unigridd brochure on sight-impaired visitors,” he says. “Our goal was to provide an equivalent experience.” Justice and the rest of the team, through their discussions with the accessibility experts, realized that various reasons and conditions lead to sight impairments, and that the needs of visitors with low-vision vary widely. Everyone

agreed that, while a large print brochure would not meet the needs of every sight-impaired person, they needed to provide a folder that would reach the broadest possible range of sight-impaired visitors.

The team concurred that the approved National Park Service typefaces NPS Rawlinson and Adobe Frutiger—with their generous x-heights and open letterforms—met all the criteria for optimal readability. To ensure the brochure content addressed the needs of low-vision visitors, C&O Canal interpretive ranger Geoffrey Suiter crafted new interpretive text that focused very tightly on the park’s key interpretive themes, stories, and visitor information. Harpers Ferry Center editor Ed Zahniser helped to rewrite and further refine the text.

The large print brochure includes two historic photographs of boats operating on the old canal. Artwork reused from the *Chesapeake and Ohio Canal* handbook clearly shows and explains how a lift lock and its lock gates worked, allowing readers to understand one of the key structures common along the entire length of the canal. Photos and artwork



### Bibliography of Standards

- American Foundation for the Blind (AFB)
  - Tips for Making Print More Readable
- American Printing House for the Blind (APH)
  - Large Print: Guidelines for Optimal Readability
- Lighthouse International
  - Simple Steps to More Readable Type Through Universal Design
  - Effective Color Contrast: Designing for People with Partial Sight and Color Deficiencies
- Center for the Partially Sighted
  - Print Guidelines
- National Association for the Visually Handicapped (NAVH)
  - Large Print Publications
- National Federation of the Blind (NFB)
  - Standards and Criteria
- Smithsonian Institution
  - Guidelines for Accessible Exhibit Design/Checklist for Publications
- Society for Environmental Graphic Design (SEGD)
  - Accessible Text Guidelines

(NPS Photo by David T. Gilbert)

were carefully manipulated to obtain the best possible clarity and contrast.

### Selecting a Brochure Format

The page size of the large print brochure was predetermined by the existing NPS printing contract, which provides cost-efficient bulk pricing on a large range of Unigrid page sizes. The team settled on the B6 Unigrid—the largest sheet-size available at 23-7/16 inches by 16-9/16 inches. The brochure also includes a B3 insert for the C&O Canal map.

After experimenting with a variety of folds, the team chose a simple tabloid newspaper format to allow for the largest possible type size, reduce any visual interference, and keep the folds simple and easy to understand. A two-column format was ultimately adopted, with a vertical line separator, to keep sentence length short. This would help avoid problems many low-vision readers have following long lines of text across a page and then finding their way back to the next line of text. While most large print guidelines discourage the use of side-by-side text columns, several reviewers agreed that low-vision users would be able to easily fold the page in half and avoid any confusion with the adjacent column.

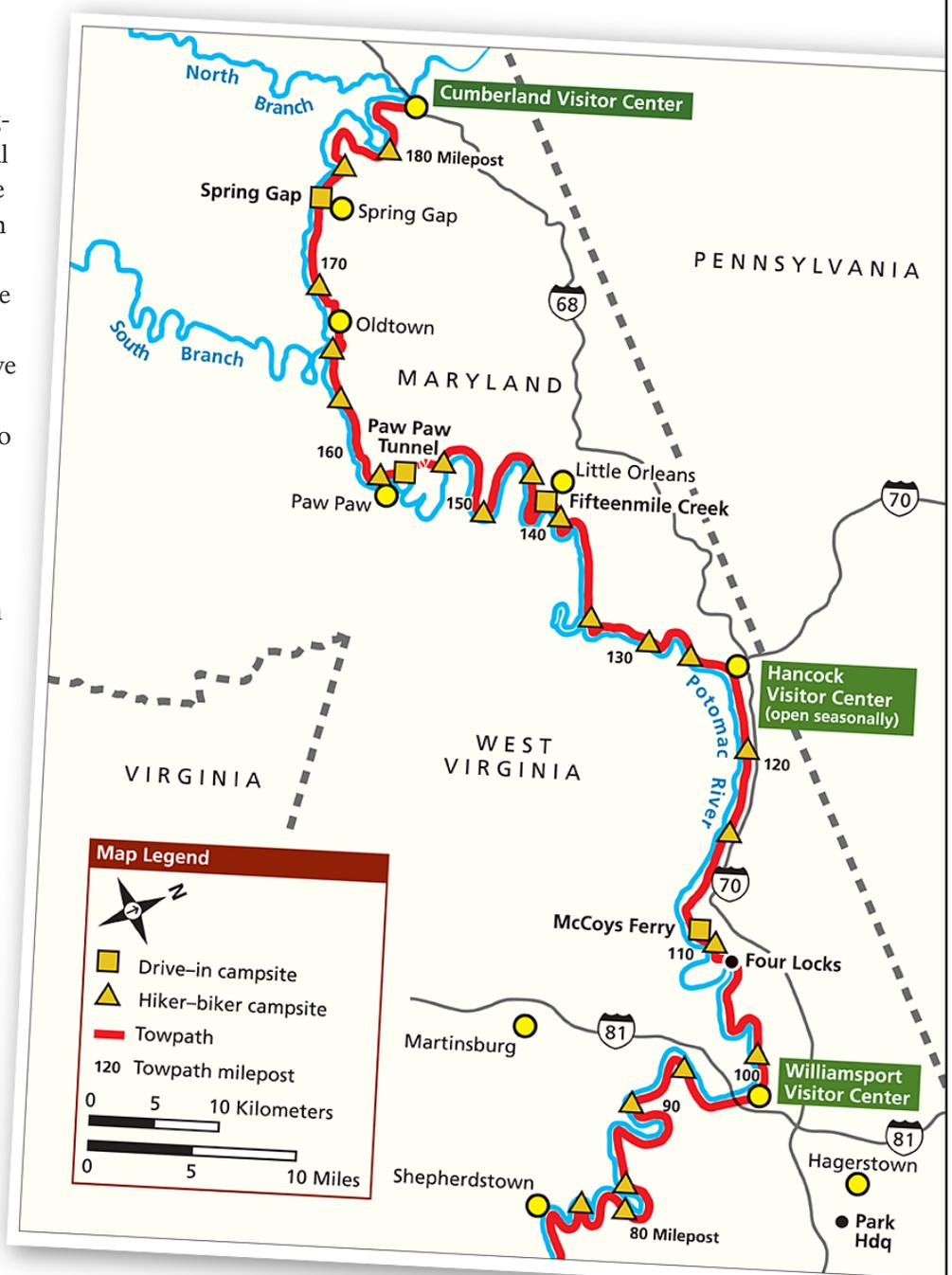
### Designing a Map That Works

The final challenge for the large print brochure team was the park map. HFC cartographer Lori Simmons, in an effort to demonstrate the challenges of creating a suitable map, printed out the C&O Canal's existing Unigrid map at a size large enough to render the smallest type readable to low-vision users. As Simmons pulled the map off the plotter and spread it across the floor, it stretched 14 feet in length!

The expert reviewers, however, insisted that the large print brochure

should include a park map. The purpose, they pointed out, was not to provide directions or minute park details, but to give low-vision park visitors context. The map needed to provide these visitors with a sense of scale, allowing them to see where they were within their surrounding environment, and the relationship between their present location and the rest of the park. In the case of the C&O Canal, a map could quickly orient low-vision visitors to the linear nature of

*Large print brochure map of the Chesapeake & Ohio Canal.*



the park, and to key places and points of interest along the 185-mile towpath.

To help Simmons, Chief of Interpretation Bill Justice created a prioritized list of geographic categories to include on the park map. As he and Simmons reviewed successive iterations of the large print map, more and more categories were dropped, until both were satisfied that a manageable amount of important and useful information was provided.

### Breaking New Ground

Simmons relished the challenge, exploring new ways to depict geography and visitor information in an accessible format. “I’ve worked on hundreds of maps for park Unigrid brochures,” she says, “but this map really forced me to explore some new and different ideas.” To help distinguish between river, towpath, campsites, and towns, Simmons chose to render the map in four-colors. She laboriously experimented with colors, asking for feedback from the expert reviewers, and making subtle adjustments to ensure that low-vision users could comprehend the map.

Simmons was especially careful with her color selection, ensuring that the map was readable to people with red/green color blindness—the most common type of color blindness (*see examples on right*). Says Simmons, “While the choice of colors makes the map a bit odd, it ensures that more people can read it. That’s the real goal.” The result is a color palette and graphic style quite different from the traditional Unigrid park map.

Simmons also took a new approach to the use of map data. While standard Unigrid maps are derived from precise Geographic Information System (GIS) and USGS Digital Line Graph (DLG) data, Simmons made some subtle but important changes. She exaggerated the thickness of both the Potomac River and the adjacent canal towpath, for instance, to make each of them more distinct. Where primary roads were too close to the river and towpath, she moved them apart to ensure visual separation.

While HFC cartographers typically separate geographic labels along a length of river or mountain range (e.g. Potomac . . . River, Blue . . . Ridge), Simmons made sure to keep these labels close together so low-vision readers could readily connect the words. Even simple things like the use of dashes required careful attention. To improve readability both in the brochure text and on the maps, longer en dashes (–) replaced standard hyphens (-).

If the reaction of Marsha Mazz is any indication, the C&O Canal’s large print brochure is a resounding success. But proof will only come with time. Staff at the Chesapeake & Ohio Canal National Historical Park have made a huge commitment to accessibility in all of their interpretive media. By continuing to work with Harpers Ferry Center, they hope to take lessons learned from their low-vision park visitors and recommend changes and improvements to the large print brochure format in the years to come.



*Two views of the same map. The bottom view shows how a person with red/green color blindness sees the C&O Canal map.*