

# NNELS



## Accessibility Report for BiblioCommons

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The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

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### About NNELS

The National Network for Equitable Library Service (NNELS) is a digital public library of ebooks for Canadians with print disabilities, and an advocate for an accessible and equitable reading ecosystem for Canadians with print disabilities<sup>1</sup>. NNELS supports principles of openness, inclusion, and choice. NNELS is hosted by the BC Libraries Cooperative, a community service not-for-profit cooperative and a national leader in information and technology services.

Our team of Accessibility Testers has expert knowledge in the areas of accessibility testing, analysis, software development, and leadership. The team works to educate and advise publishers, technology vendors, and public libraries on best practices for accessibility. Our testers have lived experience with a range of

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<sup>1</sup> Print disabilities are defined by Canada's Copyright Act and include visual, mobility, or comprehension impairments such as dyslexia.

print disabilities, including blindness, low vision, and learning disabilities.

## **Introduction**

BiblioCommons facilitates access to content offered by participating public libraries. Such content includes books, audiobooks, magazines, music, movies and TV shows, and video games. Both physical and digital content is available for patrons to browse and check out.

The service is offered as a website. Our testers used screen-reading and magnification software to assess the usability of the website across supported platforms. Readers can find a complete list of all the software and operating systems used in this assessment in this report's *Systems and Assistive Technology* section.

This assessment aims to determine the usability experience of readers with print disabilities and to what extent they can access content through their local public library effectively and efficiently. While this report aims to provide an overview of the accessibility performance across supported platforms, this is not an in-depth review of BiblioCommons itself. As a result, some functionality may not be discussed at all or in-depth.

## **Introduction to Assistive Technology**

All mainstream operating systems include built-in screen readers (Narrator on Windows, VoiceOver on Apple devices, and TalkBack on Android) that read the contents of the screen out loud, allowing users with visual disabilities to browse apps and websites, send and receive texts and emails, and accomplish many other tasks with ease. Keyboard commands and custom touch gestures provide a flexible way for a user to find and interact with the controls on-screen. Windows also has alternative screen-reading software available, most notably a commercial option called Job Access with Speech (JAWS) and a free and open-source option called Non-Visual Desktop Access (NVDA).

The text spoken by a screen reader can be sent to a refreshable Braille device. Mainstream operating systems are also equipped with user interface magnification, large text options, and high-contrast viewing mode to assist people with low vision.

To ensure the usability and accessibility of an application by people with print disabilities, all functions and controls must be accessible using assistive technologies. The DAISY Consortium explains that the basic assumption of accessibility evaluations is that reading systems "should support reading with eyes, ears, and fingers." ([DAISY Consortium, 2017](#)). It should be possible for users to read the content of the document by:

- Reading the text with screen readers or self-voicing text to speech (TTS) applications
- Adjusting the display, including font size, alignment, and colour contrast, or a combination of some or all these options
- Reading the text with a refreshable braille display
- Reading with assistive technologies designed for persons with dyslexia or other disabilities
- Reading with the app's built-in read-aloud functions

## **Accessibility Performance and Recommendations**

This section will dive deeper into specific accessibility issues encountered while testing the BiblioCommons website. Below you will find the testing results and their related recommendations as they pertain to:

- Navigation and Layout
- Signing In
- Searching and Browsing
- Content Access and Management
- Profile and Settings
- Visual Adjustment

Finally, the *Development Recommendations* sections contain suggestions for improving the interface. These suggestions will be relevant to any issues or observations noted above.

## **Accessibility Summary**

The BiblioCommons platform was designed and developed with accessibility in mind. Both screen reader and magnification users will find that nearly all of its features are accessible and that specific accessibility attributes have been implemented into the platform's controls.

Despite accessibility having been considered, there are several shortcomings with the user experience. Several of our testers found that the website was clunky to operate, often requiring many clicks and much scrolling to access options and information. Some interface elements were found to be too verbose, particularly by screen reader users who observed accessibility roles being excessively applied and accessibility labels containing text longer than necessary. There were also instances of inconsistent behaviour reported, where performing the same operation on similar controls would have differing results. Low-vision testers reported a generally positive experience but noted inconsistencies in how colour schemes and contrast were applied.

While accessibility and usability are related, the former does not guarantee the latter. The BiblioCommons platform is largely accessible, but many improvements can be made to make it easier to use.

## **BiblioCommons Website**

### **Navigation and Layout**

The website's layout features a header with navigation menus and the search form, the main content region, and a footer containing additional navigation and links to supplemental and legal information. The header and footer remain consistent and do not change from page to page.

Screen reader users identified some errors with the navigation menus in the header. The controls to expand submenus are read as links when they operate more like buttons. Expanding a submenu causes some screen readers' focus to be moved to the first item in that submenu. This is likely because the site uses modals for these menus with the assigned role="application," which causes NVDA to drop into focus mode and change the screen readers' focus. Short of redesigning this section of the page so that new content loads below the given button, mitigating this problem would be difficult. For popups, like "Hours & Location," modals are ideal because they have interactive elements like a library search. Testers had differing opinions about the change of focus in submenus and popups. Some found it unexpected and unintuitive, while others expected that their focus would be moved to the first item.

When collapsing a submenu, it does not announce that it is being collapsed. In some cases, the control will continue to report as being expanded when it is collapsed. On the mobile site, screen readers additionally do not announce the "collapsed" or "expanded" state of these menu links, so users may expect the links to lead to a new page instead of revealing a menu. Testers found multiple instances of this issue throughout the website.

Some links have more than one role applied to them, such as the language switcher being identified as both a link and a button. VoiceOver users encountered extraneous, unlabeled, and unclickable links in the menu for browsing books in digital formats. However, this did not interfere with being able to click any of the other links. On the mobile site, the additional content revealed by activating links such as "Hours & Location" is incorrectly rendered after all other controls on the page, which causes screen readers to believe this content is located after the page footer.

The website makes liberal use of headings. This provides a vehicle for quick keyboard navigation between page sections, but the hierarchical structure is suboptimal. Heading levels are frequently skipped. For example, a page's main level 1 heading is

followed by a level 3 heading to mark the start of a section. Proper heading structure uses level 2 headings to mark sections, level 3 headings to mark subsections of these sections, etc. This makes the relationships between content on the page clear to everyone and further eases keyboard navigation by allowing screen reader users to jump to headings of the desired level.

### **Signing In**

Testers logged into the website using a specific Edmonton Public Library URL and library card number that was provided to them. The process was found accessible, although the team identified a few areas for minor improvement.

Having the sign-in link featured more prominently on the page rather than being tucked away in a submenu and offering a “stay logged in” option would improve the general ease of use.

Screen reader users found that all fields and buttons were well-labelled. However, in some situations, after entering incorrect login information, they had trouble maneuvering the cursor to delete the offending text from the form fields. A clear button would help to address this, as would having the insert position set to the end of input fields by default rather than the beginning.

One low-vision tester found the outlining around the input fields too faint and the text they entered too small. Otherwise, magnification and high-contrast users reported the process to be easy and accessible.

### **Searching and Browsing**

Basic keyword searches can be performed by typing into the search field in the header. This process posed no challenges to any of our screen reader testers. Screen readers announce when suggestions populate and will navigate through them when the down arrow is pressed. A low-vision tester reported that the focus indicator disappeared when focusing on the label for the search field, but otherwise, they did not have issues seeing or operating the search field.

Controls to set parameters for a basic search are operable but are missing roles and accessible information about their state. As a result, most screen readers do not read whether the expandable buttons are collapsed or expanded and do not identify the parameter options as being links or buttons. The exception is TalkBack, which was found too verbose when reading these controls. Low-vision testers found these menus to be easy to see and use.

The advanced search page is rather cluttered, and the number of options available can be overwhelming. However, it could be argued that the nature of such a feature and the fact that it is geared toward advanced users makes this somewhat unavoidable. Testers encountered issues with the dialogue that popped up when the query field was typed into. Having to start typing, dismiss the message, then continue typing was cumbersome. VoiceOver users encounter additional problems with the dialogue box as it appears as soon as VoiceOver focus enters the query field, which causes the form below it to disappear. To use the advanced search form, VoiceOver users must navigate it without focusing on the query field.

The labelling on the form to construct an advanced search is sometimes unclear, with multiple fields being given identical labels. Screen reader users must explore the form to locate additional context. In contrast, labels for the format fields are too verbose, and navigating through them can be difficult.

Browsing search results was generally intuitive and accessible. Results are well-formatted, with headings for quick keyboard navigation. All relevant details are displayed, and there are several view options available. Some sort and filter controls have excessive or incorrect ARIA roles, and some controls which expand menus report their state to screen readers while others do not. A low-vision tester reported that the current format tag next to "Active Filters" in the menu and the buttons to check out books were presented using a different colour scheme than the rest of the page.

BiblioCommons offers a comprehensive array of options for browsing and discovering books of interest. While this helps the platform cater to many use cases, it can also be a little bit clunky to use at times when searching for categories to drill down into while browsing. For example, if a user wishes to search for science fiction in ebook format, they would select “ebook” from the browse menus but would then have to navigate through much of the page to locate a carousel containing science fiction titles. Other pages, such as the award-winner and bestseller catalogues, feature filter controls at the end of the main content. They are inconvenient to locate, particularly for new users who are still learning the site’s layout.

There is some inconsistency in how book listings are displayed on the different search results and browse pages. Details shown on some pages are not listed on others, and controls for performing actions, like placing holds and shelving, accompany listings on some pages but not others. The functionality and accessibility of action controls also varies, with labels being too verbose on some pages and not descriptive enough on others. The website offers view options such as covers, details, or compact view, but the available options are not consistent across all pages containing book listings. Usability and predictability would be enhanced by displaying book listings in the same format on all search results and browse pages and allowing the user to select from the same view options on every page.

A low-vision tester reported that the “Place Hold” and “For Later” buttons have a different colour scheme and contrast than the rest of the page they are on. This can be jarring and make them difficult to read, particularly if the user requires many visual adjustments.

### **Content Access and Management**

On mobile devices, carousel views are scrolled with the Next/Previous buttons rather than being given individual controls for each item. These two buttons are both labelled “carousel\_view\_item.” To a screen reader user, these buttons are

virtually identical. When the carousel scrolls to the next or previous item, the screen reader focus is placed on the title of the book, so it is necessary to repeatedly move back to the buttons to explore all available items. This automatic change of focus creates a very inefficient workflow for a screen reader user, who would need to swipe several times to return to the confusingly-labelled scroll buttons after each new title has loaded. However, if the automatic focus change is removed, a screen reader user would need to explore the page to find the new book's title, which would also be inefficient. One solution to this problem would be to automatically announce the title of each new book after the carousel is scrolled. If the user is interested in that book, they could navigate to the title and go to its record page. If not, the screen reader focus would still be on the scroll button.

Every record link on the "Recent Activity" page (the landing page when logging in) cannot be activated by an iOS user who relies on VoiceOver. Double-tapping on such a link has no noticeable effect on the page. Desktop browsers and screen readers seem to interact with these links correctly, and other links throughout the site can be activated normally with VoiceOver.

Catalogue items can be shelved, checked out, or have holds placed on them from many areas of the website. Except for carousel displays, these controls are available everywhere books are listed, although, as outlined in the previous section, the display and labelling can be inconsistent from page to page.

Action controls can also be accessed on the details page for each title, which users can view to find more in-depth details about the content. Low-vision testers found the details page easy to navigate and read. Screen reader testers identified buttons having excessive labels and verbose labelling. When a title's summary is expanded, the focus of screen readers' remains on the control that expanded it, requiring the user to scroll up from the end to read the rest of the description.

Performing most actions displays a modal where the user can confirm or cancel the action and, where applicable, select options

such as format or branch location. Screen reader focus is usually moved to this modal to ease navigation, although one tester observed VoiceOver not doing so when placing holds via curated, bestsellers, or award winners lists. Some modal controls have overly verbose labelling, and some logo images contain meaningless alt text. All actions can be performed using a keyboard. Low-vision testers did not report any challenges.

Screen reader testers observed considerable issues with focus returning to the page after a modal disappears upon completing an action. After performing actions such as placing holds, returning books, removing books from shelves, or deleting comments, a screen reader's focus will sometimes be ejected from the page, and the user will not be able to navigate the page. To resume browsing, the user must refresh the page or navigate to a different one by pressing the back button, manually entering a web address, or selecting it from their browser's bookmarks. This behaviour is inconsistent across pages and actions, with some combinations causing it and others not.

A user's held, checked out, and shelved content can be accessed from the navigation menu. All testers could locate their content, though one tester expressed that it would be helpful to include this content or links to it on the dashboard, and another found the multiple ways to access shelves to be confusing and redundant. Feedback regarding holds, checked-out, and bookshelf pages included similar issues to other pages, including overly verbose button labels, extraneous and unnecessary ARIA roles on controls, and buttons whose colour scheme and contrast do not follow that of the rest of the page.

Books in digital formats can be accessed online, either within the browser or by downloading them and reading offline via an app. When the "Access Item" button is pressed, a frame is displayed containing the available options. Several testers had difficulty locating this frame with screen readers. VoiceOver users must interact with the frame to explore its contents and may easily overlook it, and other screen readers, such as JAWS, may be set to ignore certain frames. The modal was also confusing for

magnification users, who reported that there was not enough indication of further options other than those that initially fit on the screen. They recommend surrounding the cover, title, and options with a border, so it will be more apparent that the entire pop-up is not displayed.

Testers accessing the frame reported a pleasant and accessible experience reading books. This functionality is provided by a third-party platform and is out of the scope of this report.

Accessing and reading magazines is similarly done through a separate website. Testers reported issues using this, particularly with identifying and accessing back issues of magazines. This is also out of the scope of this review but is mentioned to raise awareness that if all of BiblioCommons' accessibility shortcomings are remediated, one feature would still be utilizing a separate, less accessible system.

### **Profile and Settings**

Account settings are split across several pages, allowing users to edit their personal and profile information and set their library preferences. Low-vision testers did not encounter any difficulties with these interfaces or processes. Screen reader testers noted several controls with missing roles or labels, which made it difficult to know which setting was being changed or which state it was set to. Single-click holds and borrowing history settings, in particular, proved impossible for some screen readers to read or update. Profile information such as username and password are less problematic, with fields being well labelled and no unexpected behaviour observed when navigating to or typing into them.

### **Visual Adjustment**

The website's contents adapt well to the operating system and the browser's magnification and contrast settings. Text can be enlarged to the user's desired size, either with or without enlarging images at the same time, depending on the settings or extensions used. The colour contrast made content somewhat

difficult to distinguish in some bright environments, but high contrast extensions are an effective remedy. As noted in various sections of this report, some elements do not follow the colour and contrast schemes as the rest of the page they are on. None of our testers made mention of visual settings that could be set using the website itself, meaning either they are unnecessary, difficult to find, or not present.

### **Development Recommendations**

- Clean up and standardize ARIA roles across the site, so elements have only one role which is most appropriate for their functionality. Only custom elements require roles; when implemented correctly, standard HTML controls do not require roles.
- Update the code of custom components to ensure screen readers can report their state, such as expanded or collapsed.
- Clean up and standardize ARIA labels across the site so that all controls have a label that describes their purpose but is not more verbose than it needs to be, so controls are read consistently throughout the site.
- Modify the heading structure, so it follows a logical hierarchy: One level 1 heading at the start of the main content, level 2 headings for page sections, level 3 headings for subsections within sections, etc. Do not skip heading levels.
- Change the colour and contrast scheme of elements which drastically differ from the rest of the page they are on so they become more consistent.
- Verify that all content and controls meet the 4.5:1 colour contrast ratio requirement and adjust the colours of any that do not.
- Improve how screen reader focus is handled when opening or closing modals so it is moved into the modal when opened and properly returned to the main page when closed.
- Optional: Instead of a frame, use the same type of modal for displaying options when accessing digital items.

- Make the warning dialogue box on the advanced search page less intrusive, so users do not have to dismiss it every time and so screen reader users do not have to avoid focusing on the query field to access the form.

## Conclusion

The accessibility features of BiblioCommons, while flawed, are extensive and clearly received attention during development. Our testers encountered issues caused by accessibility being implemented incorrectly rather than missing altogether. In most cases, there are examples of how to implement it correctly elsewhere within the platform, which should assist with improving and standardizing accessibility across the site.

While not strictly mandated by accessibility guidelines, the user-friendliness of the site could be enhanced by requiring fewer clicks to access common features. Some pages could be reorganized to reduce clutter and enable quick access to categories or other browsing and filtering options. Making small usability improvements and addressing the accessibility issues discussed in this report could turn BiblioCommons into a gold standard for accessible library platforms.

## Systems and Assistive Technology

- Operating Systems
  - Windows 10
  - macOS 12.4 and 12.5.1
  - Android 11
- Browsers
  - Chrome versions 103 and 104 (Windows, macOS, and Android)
  - Safari version 15.6.1 (MacOS)
  - Firefox versions 103 and 104 (Windows)
- Screen-readers
  - NVDA version 2022.2 (Windows)
  - JAWS version 2022 (Windows)

- VoiceOver (macOS)
- TalkBack version 13.1 (Android)
- Magnification
  - Zoom (MacOS)
  - ZoomText version 2022 (Windows)

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