

# NNELS



## Accessibility Report for Freading

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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**

Freeding is an online platform which provides access to digital books through participating public libraries. The service is offered as a mobile application and website. NNELS was provided with test accounts through the Northwest Territories Public Libraries.

Our testers used screen-reading and magnification software to assess the usability of the apps and 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 Freeding 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 users 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, extensive 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 Summary

The Freading Ebook Services is a digital library available to participating library card holders. Freading suffers from poor heading hierarchy and page structure on all tested platforms, inconsistent or missing button labels, and other markup issues. It is challenging for screen reader users to navigate the interface. Many testers reported that the number of steps required to begin reading a book was unnecessarily cumbersome, particularly when using the website. Freading uses Adobe Digital Editions (ADE) for reading content, which is problematic for screen-reader users. A longstanding bug in the desktop app caused it to freeze regularly when reading EPUB files, and the text of ebooks was challenging to navigate on Android and entirely unreadable on iOS.

## Accessibility Performance and Recommendations

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

- Library Access
- Signing In
- Searches

Finally, the *development recommendations* sections contain suggestions for improving the interface on each platform. These suggestions will be relevant to any issues or observations noted above.

### Freading Website

#### Signing In

No issues were encountered signing in. On the first login, testers were presented with an intro page which explained how to install Adobe Digital Editions (ADE) and register an account.

#### General

The Freading website is fraught with incorrect or missing heading usage. Screen reader users rely on heading navigation to jump quickly between page sections, so having an inconsistent heading structure can significantly affect efficient navigation and the user's understanding of page layout.

The Freading homepage contains navigation links for other parts of the site and "Picks of the Week." The only significant issue on this page is the incorrect use of heading hierarchy. Each "Picks of the Week" was a level 1 heading, with the book's title a level 2 heading. A level 1 (or top-level) heading should only be used to denote the start of the main content on a page.

Each download link is placed before the heading for the book title, so screen reader users need to navigate back to find it. This is

also unintuitive and could cause the wrong book to be downloaded depending on how the user is navigating the page.

The FAQ page contains question categories and expandable questions under each category. This page has no meaningful HTML. The questions are clickable pieces of text rather than links, and the categories are stylized pieces of text rather than headings. This means a screen reader user cannot navigate between question categories and does not receive feedback when a question is expanded or collapsed.

On the categories page, each category link is also a level 2 heading. There is no level 1 heading at the start of the main content, nor does the page use any landmarks such as `<nav>` or `<main>`. For screen reader users, this heading clutter is verbose (the user hears "heading level 2" before the name of every link), and that many headings means that navigating forward or backward by heading is no longer useful. A single heading before the categories would allow a user to jump to the top of the list quickly. An HTML list containing these categories would also clarify page structure and allow a screen reader to detect the number of categories in the list, move to the next or previous list item, or jump to the top and bottom.

## **Searching and Browsing**

On pages which contain a list of books (such as the page encountered after choosing a category from the *Categories* page), there is no level 1 heading at the start of the main content. Titles are not marked up as list items, so navigating between them with a screen reader is not efficient.

Titles can be sorted using combo boxes on the page. When navigating these combo boxes with a keyboard (using the tab and arrow keys,) the page refreshes while scrolling through options. This type of automatic combo box should allow the user to adjust the options and press a "Go" button to finalize the selections. This issue can be worked around by pressing alt+down to open the combo box first, but this is an extra step, and many screen reader users will not know how to do this.

The same heading and combo box issues discussed above are present on the search results pages. These pages also have additional problems. First, while there is no heading for the start of the main content, there is a level 3 heading at the beginning of the "filter" section (which is at the very top of the main content), and each of the filtering criteria has a level 4 heading. This hierarchy is incorrect since there is no level 1 or level 2 heading above the filter section. If a level 1 heading is added to the start of the main content, the "Filter" heading should be level 2, and each filtering criteria should be level 3. Aside from the incorrect levels, this layout is accessible and well-structured. Screen reader users can jump from one filter to the next using heading commands, and the options under each filter are presented as a list.

Each filter option under "Average Rating" has a label of "& up," as though the number of stars is missing. This may be because the star ratings are presented as images which are not correctly labelled. At this time, screen reader users can't differentiate between these rating options.

There is no HTML separation between the list of filters and the list of search results, nor are there headings on the results themselves. Therefore, screen readers cannot navigate past the filters and find the results list. The best way to accomplish this with a typical screen reader is to jump to the first combo box on the page, which is the "Sort" control. The search results are directly below this combo box. A user should not need to remember this to navigate the page efficiently. Adding a level 2 heading before the results list would eliminate that need.

In the search results list, each book has a title and a book cover. These book covers are given an alt text (label) with the title of the corresponding book, resulting in duplicated controls that screen reader users will need to skip over to read each new result. Typically, alt text is helpful when a control doesn't have a corresponding text label. Since each book cover is immediately followed by its title, this alt text should be eliminated to avoid page clutter. This can be done by changing the alt attribute to an

empty string (alt=""), marking the image as decorative and preventing screen readers from announcing it.

The first heading on a book's details page is a level 2, placed after the wishlist and download links. In many cases, a screen reader user may navigate to the first heading and move down the page from there. They may never notice the links above the heading, believing the heading to immediately follow the top navigation section. Moving the heading to the start of the main content is highly recommended. Since there is no level 1 heading on the page, this heading should not be a level 2.

The rating selectors are displayed as text pieces rather than buttons or links. Most screen readers can report these controls as clickable, but there is no way to move directly to them using a keyboard. Changing these controls to buttons would clarify their purpose for screen reader configurations that do not support reporting clickable pieces of text and allow all keyboard-only users to find and activate them.

The "People who read this book also read..." section is missing a heading. Unlike in the search results, the book covers are missing alt text; unfortunately, the titles are not clickable. Screen reader users must read the book's title, then navigate to the previous line to activate the unlabeled link. Merging these cover/title sets into a single link would make more sense.

## **Reading and Navigation**

Freeding does not have reading functionality; instead, users download the books and open them in Adobe Digital Editions (ADE.) ADE was not thoroughly tested for this report. However, NNELS is aware of a severe stability issue that causes the app to freeze permanently while reading EPUB files with a screen reader. Adobe has not provided a fix for this issue as of this writing. Despite extensive accessibility support in ADE, screen reader users could not effectively read books.

## Visual Adjustment

The website does not contain meaningful visual adjustment settings. Since books can only be read using ADE, any visual adjustment relevant to reading is also made within ADE. Adobe provides information about available accessibility settings on the [Get started with Adobe Digital Editions](#) page.

## Development Recommendations

- Maintain a consistent heading hierarchy across the site by adding a level 1 heading at the start of all main content, a level 2 heading at the beginning of any relevant sections, etc. Avoid excessive heading clutter.
- Eliminate duplicate title labels on the search results page by removing the alt text from book cover images.
- Prevent combo boxes from reloading the page until a “Go” button is pressed.
- On the search results page, ensure the rating filters are labelled correctly.
- On a book’s record page, ensure the rating selections are rendered as buttons or links.

## Freeding App for iOS

- Tested iOS version: 14.6+
- Tested app version: 2.6

## Signing In

Because of the use of Adobe Digital Editions for reading content, iOS users needed to sign into both an Adobe account and a Freeding account to use the service.

All the buttons on the Adobe sign-in screen are missing an accessibility label, so VoiceOver users cannot identify them at all except by pressing them.

After signing into the app, a screen appears with information on setting up an Adobe account. This screen has an “Always skip this page” button with no control type, so VoiceOver reads the text but does not inform the user that this control is clickable.

## General

The library tab contains an unlabeled button for changing collections. All other buttons have descriptive labels, but some include the word “icon” in their name, which is overly verbose.

After pressing the “info icon” button, the resulting screen has four unlabeled controls, including the buttons for opening the privacy policy and terms of service.

## Searching and Browsing

The “Get Books” tab uses an embedded web browser to display the Freading website. Any relevant issues discussed in the *Website* section of this report are also present here. Any exceptions and additional issues will be noted below.

The embedded browser has navigation buttons at the bottom labelled “webforward” and “webback.” Some screen readers may mispronounce these, so changing them to “forward” and “back” is recommended.

VoiceOver can navigate to the top navigation links on this page, but nothing happens when double-tapping them. This may be by design, but if that is the case, hiding them from screen readers in this view would reduce page clutter and confusion.

On the records page, the controls for rating a book are not announced as links or buttons. These should be given aria roles or changed to HTML buttons. Unlike Windows screen readers, VoiceOver does not announce them as clickable controls.

The combo boxes on this website function correctly with VoiceOver—despite being problematic with desktop browsers—because of how iOS renders them. Each is displayed as a button which invokes an accessible picker at the bottom of the screen.

## Reading and Navigation

The ebook viewer was largely inaccessible to screen reader users throughout testing. None of the text is readable by VoiceOver, and the text control itself can’t be reached with VoiceOver

navigation. This means VoiceOver users are not able to read the text of books and are not able to tap the screen to reveal reading controls. To exit the inaccessible viewer, it was necessary to force-quit the app.

Low-vision testers had a much better experience and found that the text was customizable and easy to read. One tester determined that when the text size is changed, the new page size is not considered when performing a search, causing the wrong page to be loaded.

## **Visual Adjustment**

The app has an impressive set of adjustments for low-vision users, including font size, manual font and background colour changes, line spacing adjustments, a choice of scrolling or paginated view, and margin settings. Notably, the app lacks a dyslexic font and does not have a way to disable hyphenation. Combining these two settings would provide dyslexic readers with a better reading experience.

## **Development Recommendations**

- Ensure all home and info screen buttons have clear and concise labels.
- Label all buttons on the Adobe sign-in screen.
- Consider changing the page shown in the “Get Books” tab so it does not include top navigation and other page clutter.
- Ensure the text area of the ebook viewer can be read with VoiceOver.
- Add a dyslexic font.
- Troubleshoot incorrect page numbers when searching for text after the page size has been adjusted.

## **Freeding App for Android**

- Tested Android Version: 11 and 12
- Tested app version: 3

## Signing In

Low-vision testers found the controls on the login screens challenging to see and press. They reported that the text fields for the library barcode and PIN could not be enlarged to double-check the text entry. The text fields on the Adobe sign-in screen become faint and difficult to locate when high-contrast settings are active.

## General

Once the Adobe sign-in process is completed, the main component of the Freading app for Android appears to be a wrapper for the Freading website. Unlike the iOS app, the home screen is simply a website rendering. All issues discussed in this report's website section, such as missing headings, mislabeled rating links, and other markup issues, are also present here. The library view and integrated ebook reader are specific to the Android app and will be discussed below.

## Library View

Since the Freading website does not have built-in library management, the Android app includes a library section which uses native controls. All downloaded titles are listed in this section, with options to switch between list and grid view. TalkBack does not announce the names of books in grid view, so list view is the only option for screen reader users.

## Integrated Ebook Viewer

The Freading app does not require you to install Adobe Digital Editions to read books. It has an integrated ebook viewer, which is automatically launched whenever a book is downloaded.

When a book is open, it is possible to show or hide the reading controls by tapping the screen. With TalkBack enabled, this is accomplished with a double-tap. Testers found that double-tapping a piece of text in the middle of the screen can sometimes cause the book to scroll to a different page, so it is necessary to move to the top or bottom of the screen and then double-tap.

Unfortunately, many controls—including the buttons for moving to the next or previous page—are unlabeled. The only controls with labels are the bookmark and search buttons.

When returning to a bookmark or jumping to a text search result, TalkBack's focus is not moved to the correct text section and is kept on the previous page. This means a screen reader user cannot make use of bookmarks or text search.

TalkBack reads each search result three times as three separate controls when searching within a book. These redundant controls should be removed so that TalkBack or keyboard users do not need to move through them to get to the following result.

### **Visual Adjustment**

The integrated ebook viewer allows adjustment of the font (though it lacks a dyslexic option), font size, foreground and background colour, and line spacing. This was sufficient for low-vision testers' reading needs, though the reading controls proved difficult to activate and see.

Low-vision testers could not use the pinch gesture to zoom, even in cases where a web browser would normally allow this.

### **Development Recommendations**

- Troubleshoot inconsistent reading control behaviour and ensure TalkBack can activate them.
- Label all elements of the ebook viewer, including the page controls.
- Add labels to books in cover view, enabling TalkBack to read them.
- Ensure that when moving to a page bookmark or text search result, TalkBack's focus is also correctly moved to that page.
- Add a dyslexic font.
- Ensure that users can use the pinch gesture to zoom into the text.

## Conclusion

The Freading apps and website contain many accessibility barriers which make the service difficult or impossible to use when working with assistive technology. While many of these issues can be worked around by a technically inclined user, the ebook viewers on Android and iOS are nearly unusable with a screen reader. This lack of access to core functionality makes the service unusable for screen reader users.

As long as Freading relies on Adobe Digital Editions for desktop reading, the issues experienced while reading ebooks are unavoidable; however, there is still much that can be done to improve the experience across all platforms. Addressing the various accessibility barriers in the website and mobile applications would make the service usable on mobile devices and allow readers to find other workarounds on the desktop web if necessary.

## Systems and Assistive Technology

- Operating Systems
  - Windows 10 (21H1)
  - iOS 14+
  - Android 11 and 12
- Mobile Applications
  - Freading 2.6 (iOS)
  - Freading 3 (Android)
- Browsers
  - Chrome 90, 91
- Screen-readers
  - NVDA 2020.4 (Windows)
  - JAWS 2021 (Windows)
  - VoiceOver Touch (iOS)
  - TalkBack (Android)
- Magnification
  - Magnifier (Windows)
  - ZoomText 2020 (Windows)

- Zoom (iOS)

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