**Requirements Document**

**Wild Whales Reporting**

**System Improvements**

**Group 6**

**January 27, 2021**

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## Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Date | Reason for Changes | Version |
| Anar Kazimov | 31/Jan | Added some priority and software interface info | 0.1 |
| Anar Kazimov, Bryson | 02/Feb | Section 1 and 5 edits. Section 6 started | 0.2 |
| Bryson | 06/feb | Minor test edits throughout and section 2 | 0.3 |
| Eric Power | 31/Jan | Initial draft of Sections 2.3 and 2.4 | 0.4 |
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| Anar Kazimov | 25 Mar | Adding Requirements Rationale | 5.1 |
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| Eric | 30 Mar | Editing for clarity and accuracy | 5.3 |
| Bryson | 11 April | Making adjustments for final submission | 6.0 |

## 1 Introduction

### 1.1 Purpose

BC Cetacean Sightings Network (CSN) is a research and conservation program of Ocean Wise’s Marine Mammal Research Program, in collaboration with Fisheries and Oceans Canada. The goal of the initiative is to increase public awareness of British Columbia’s cetaceans and sea turtles and the threats to their survival.

This Requirement Document outlines the requirements for an improvement to the BC Cetacean Sightings Network’s (CSN’s) Wild Whale reporting system. This new system carries on many of the goals from the current system, namely:

* Enabling public users to submit reports of cetaceans and sea turtles that they have seen while on, or near, the ocean off British Columbia.
* Interacting synchronously and asynchronously with systems that provide the public, industry members, researchers, and the government important data about the locations and behaviours of cetaceans and sea turtles.

Additionally, the new system will focus on:

* Allowing public users to make reports of time spent on or near the ocean when they did not see cetaceans.
* Increasing the accuracy of confidence rankings on reports.

### 1.2 Project Scope

This project will replace the current Wild Whale reporting system. It involves all components of that system: a public reporting system, the data storage, and access and automated analysis. Part of the project includes porting over all the historical data from the current system, both whale sightings and user accounts.

### 1.3 Glossary of Terms

Acronyms and uncommon terms used in this document are defined here:

* ARCGIS: is a common Geographic Information System (GIS) maintained by the Environmental Systems Research Institute.
* Cetacean: a marine mammal that belongs to the infraorder Cetacea, including whales, dolphins and porpoises.
* CSN: the BC Cetacean Sightings Network
* GIS: Geographic Information Systems are systems that help visualize and manage data with a spatial component.
* JAWS: a computer screen reader program for Microsoft Windows
* PCI Compliance: The Payment Card Industry Data Security Standard is an information security standard for organizations that handle branded credit cards from the major card schemes.
* PIPEDA: The Personal Information Protection and Electronic Documents Act is the law that governs how organizations must handle personal information in British Columbia.
* WCAG 2.0: The Web Content Availability Guidelines, version 2.0
* WRAS: The WhaleReport Alert System which notifies the marine industry of the location of whales to help them avoid the whales.

### 1.4 References

B.C. Cetacean Sightings Network. (2020). *Wild Whales.* Retrieved February 07, 2021 from <https://wildwhales.org/>

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Government of Canada. (2013). Standard on Web Usability. Retrieved February 07, 2021 from <https://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=24227#appB>

K. Greenan, J. Plank, and J. Wylie. (2010). Mean time to meaningless: MTTDL, Markov models, and storage system reliability. Retrieved February 8, 2021 from <https://www.usenix.org/legacy/event/hotstorage10/tech/full_papers/Greenan.pdf>

W3C. (2008). *The Web Content Availability Guidelines - version 2.0.* Retrieved February 07, 2021 from(<https://www.w3.org/TR/WCAG20/>)

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### 1.5 Overview

This document provides fundamental information to the development team on the new system under development.

Section 1 describes the purpose, scope and structure of this document. Section 2 is an overall description of the system with its product features, user classes, characteristics and operating environment. Section 3 lists systems features, their main functional requirements and corresponding priorities. Section 4 lists external interface and hardware requirements. Section 5 presents the non-functional requirements that are important for the system to operate well. Section 6 provides information on requirements that do not naturally fit in elsewhere in the document.

## 2 Overall Description

### 2.1 Product Perspective

This project is to replace the existing system the company has in place for gathering and storing whale sightings data.

### 2.2 Product Features

The products’ three main features are to take in data, store that data, and provide access to that data. Additional features include data validity and security, and tracking of individual data providers.

### 2.3 User Classes and Characteristics

**System Administrators:**

It is very important that these users have full access to the system and the tools that they have access to are reliable. It is not important that the tools they have access to are visually appealing. It is less important to satisfy these users, but very important that the tools these users have access to are well documented.

Privileges:

* Full access to read, write and edit all data, configurations, and tool integrations.
  + Ability to change access levels on user accounts between all levels.

Characteristics:

* Trusted individuals with technical experience who can be expected to safely use tools that could cause the system to crash and/or delete data, so long as appropriate documentation of the system exists.

**CSN Employees:**

It is important that the main functions these users will access, such as reading data and editing user access levels, are easy to use for non-technical users. It is important to satisfy these users to a level at least equivalent to the current system.

Characteristics:

* Trusted non-technical users who nonetheless have experience with tools for reading and using large data sets. These users will regularly be using the system to access data, and a subset of this class will regularly be using the system to modify the access levels of users.

Privileges:

* Read access to all data relating to submitted sightings and to user accounts, except data that is inappropriate for them to access according to PIPEDA, such as credit card information on donation payments.
* Ability to change access levels on user accounts between Public Users and Authorized users.

**Research Partners:**

These users will primarily use the data reading tools, and the reporting tool.

Characteristics:

* Users with varying technical experience who have a vested scientific interest in reading, analyzing, and using large data sets.
* Users will regularly be using the system to access data. Some of these users may also regularly make reports.
* Users must submit a specific proposal of why they should get access to the data

Privileges:

* Research partners must have access to data they are approved for by CSN. They should not have access to data for which they are not authorized, such as identifying information of individuals or vessel locations.
* Data access will be only to subsets of data relating to and required for the approved proposal they submitted.
* To gain access to more data an updated proposal must be approved

**General Public:**

These users will only interact with the reporting tool, and as the main purpose of the redesign of the system is to better support these users to make more accurate reports, it is extremely important that the reporting tool is well designed and built.

Characteristics:

* A wide range of technical skills, these users will likely fall into two sub-classes: those who regularly use the tool, and those who do not. A primary aim of the new system is to help grow the first of these subclasses.

Privileges:

* Ability to create an account and submit reports.
* Does not have access to see stored data
* Can review their submitted data on the submission confirmation screen.

### 2.4 Operating Environment

This project can be split into two main components which have different expected operating environments. These components, the public reporting portal and the system backend, are discussed separately below.

### 2.4.1 Public Reporting Portal Environment

The public reporting portal is expected to be used on various platforms and in various situations.

The mobile applications are expected to run on Android versions 5.0 and above and Apple iOS versions 14.0 and above as they are the most current and are recommended by Android Software Development Kit and Apple’s policy of only providing security patches for the most recent version of iOS.

The mobile applications and website will regularly be used while the user is on the water, so they should ensure that important functions and information are easily visible and main functions are shown on the home screen, with less commonly used functions available through an accessible menu.

The desktop version of the website is expected to be used primarily by users when they are no longer on the water. While it must still ensure contrast and font sizes consistent with WCAG 2.0, it does not need to be as streamlined as the mobile applications.

### 2.4.2 Backend System Environment

The backend may operate on any modern, secure, and commonly available architecture and operating system combination. To provide flexibility to the contractor, the project allows the contractor to select this combination to achieve better performance of the new system.

At a minimum, the backend must provide SFTP and SSH capabilities for the system administrators.

### 2.5 Design and Implementation Constraints

The design must take into account the following constraints:

* The main constraint will be the client’s budget (client has not yet disclosed the project’s budget)
* The client will be responsible for maintaining the system post delivery. Further edits or modifications will require a separate contract.
* The system shall ensure that data is collected and stored in compliance with BC’s PIPEDA requirements

### 2.6 Assumptions and dependencies

This document made the following assumptions based on our understanding of the client’s desires and needs.

* Users will rarely if ever try to sabotage the system by entering falsified data

The new system must interact with the following existing systems:

* Data must be transitioned from the current WildWhales reporting system to the new system.
* The new system must communicate with the WRAS in the same manner the current system does.

## 3 System Features

The system shall have the following features:

### 3.1 User Login

#### 3.1.1 Description and Priority

Members of the public and researchers need to be able to easily create an account. This feature has components that are either high or medium priority, as noted below.

#### 3.1.2 Functional Requirements

REQ-F.1.1: The Ability for Users to Create an Account - PRIORITY: High

* By default, all accounts should be given access only to the Public User authorizations.
* Only one account should be created per user.
* Email verification should be used in account creation.
* Rationale: To recognize a user’s actions across multiple sessions, they need to create an account to be identifiable by the system in subsequent sessions.
* Test Scenario:
  + TEST-F.1.1: Unite Test: 1. Create a new account 2. Check for the verification email 3. Test if the account has been created
  + TEST-F.1.2: Unit Test 1. Attempt creating a pre-existent account 2. Verify that the account creation fails

REQ-F.1.2: The Ability for Users to Reset Their Password - PRIORITY: Medium

* Users should be able to use their email to reset their password and set a new one.
* Rationale: Passwords can easily be changed in the database. Forgetting passwords prevents users from accessing the system.
* Test Scenario:
  + TEST-F.1.4: Unit Test: 1. Perform a password reset 2. Verify that the log in with the new password works. 3. Verify that a log in with the old password fails.

### 3.2 Report Portal

#### 3.2.1 Description and Priority

The data reporting portal is a high priority feature as it will act as a place for users to provide information to the system and deliver that information to storage.

#### 3.2.2 Functional Requirements

REQ-F.2.1: A form with relevant questions for users to fill out - PRIORITY: High

* The form shall prevent invalid inputs by restricting the format on specific inputs, and ensuring that the date of observations are not in the future.
* If an input is invalid, the user shall not be able to submit the form, and it shall be made clear to the user where the invalid input is.
* The form shall include information to help the users with the identification of which species of cetacean and/or sea turtle they observed.
* Rationale: Observation data needs to be reported.
* Test Scenario:
  + TEST-F.2.1: Unit Test: 1. Enter observation details into the portal and press submit. 2. Verify that the observation was entered into the system correctly.

### 3.3 Public Website

#### 3.3.1 Description and Priority

The public facing website serves two purposes. First, it serves as the payment gateway and allows the system to accept donations. Second, it helps to increase awareness and to educate the general public on the work that CSN is doing. This is a medium priority feature as it helps increase the use of the reporting system, and helps offset the costs of operating the system to the CSN.

#### 3.3.2 Functional Requirements

REQ-F.3.1: The system accepts donations from the users - PRIORITY: Medium

* The donation subsystem shall provide an interface to users that accepts donation through, at minimum, VISA and MasterCard transactions.
* The payment subsystem shall be in compliance with all relevant law, including PIPEDA.
* Rationale: CSN is using donations as a way of raising funds.
* Test Scenario:
  + TEST-F.3.1: Stub test: 1. Switch payment system from a real transaction mode to a test transaction mode. 2. Enter mock payment data. 3. Confirm that the transaction has been completed as expected.

REQ-F.3.2: The system provides information on other CSN services- PRIORITY: Medium

* The website contains information on the WRAS service and other Ocean Wise research initiatives including, at minimum, information about how sightings are used, and threats to cetaceans.
* Rationale: Website has enough of free space. Users will not see the website as credible if it doesn’t contain the essential information
* Test Scenario:
  + TEST-F.3.2: 1. Visit website 2. Ensure that the essential information is provided

### 3.4 Data Storage

#### 3.4.1 Description and Priority

The system needs to be able to collect and store the user created data to allow for the various services and tools that the CSN provides and creates. The ability to collect and store the data is a high priority feature.

#### 3.4.2 Functional Requirements

REQ-F.4.1: Data Collection - PRIORITY: High

* The system stores the data received from the Reporting Portal and Donation Portal.
* The data accepted from these systems is stored in compliance with BC’s Personal Information Protection Act (PIPA) and Canada’s Personal Information Protection and Electronic Documents Act (PIPEDA).
* Rationale: System has enough long-term memory. The purpose of the system is to collect and store cetacean data.
* Test Scenario:
  + TEST-F.4.1: Unit Test: 1. Create a dummy (test) observation in system 2. Make database calls to ensure the presence of the data. 3. Ensure the integrity of the data

REQ-F.4.2: Data Redundancy - PRIORITY: High

* The system provides an automated way to regularly backup the data as well as way for manual backups to be triggered. The frequency of automated backups can be customized by the client.
* Rationale: Losing cetacean data can complicate the whale protection plans.
* Test Scenario:
  + TEST-F.4.2: Unit Test: 1. Set an automated backup for the date that is today 2. Verify if the backup was made.

### 3.5 Data Access

#### 3.5.1 Description and Priority

This is another high priority requirement as the retrieval and use of the collected data is the most important element of the system, and is the main purpose for its existence.

#### 3.5.2 Functional Requirements

REQ-F.5.1: The system will provide data egress points - PRIORITY: High

* The system will provide ways for the data to be accessed such as an API, data portal, or physical request service.
* The system security to ensure that individuals can only use the access points to obtain the subset of CSN data that they are authorized to access.
* Rationale: Third party software is likely to request CSN data. CSN servers can handle large number of requests.
* Test Scenario:
  + TEST-F.5.1: Unit Test: 1. Make an API call to retrieve data 2. Verify the validity of the data.

### 3.6 User Management

#### 3.6.1 Description and Priority

Managing user accounts access levels is a feature that must exist, but is otherwise a low priority feature because it is not a task that will be performed often.

#### 3.6.2 Functional Requirements

REQ-6.1: CSN Employees Can Provide ‘Authorized’ User Access to other accounts - PRIORITY: Low

* The accounts with the access level of ‘CSN Employee’ can turn a regular user’s account into an authorized user account, and vice versa.
* These changes must be logged somewhere accessible to the admin, along with information of who made the change and when.
* Rationale: Trusted users like researchers need to be able to access additional information
* Test Scenario: TEST-F.6.1: 1. Enter the CSN Employee account. 2. Create a test user account 3. “Authorize” user access. 4. Test the logs.

REQ-6.2: Admin Users Can Edit User Access Levels - PRIORITY: Low

* The accounts with the access level of ‘Admin’ can set access permissions on any account.
* These changes must be logged somewhere accessible to the system administrator, along with information of who made the change and when.
* Rationale: System has many accounts. The permissions of the accounts need to be managed by trusted individuals
* Test Scenario:
  + TEST-F.6.2: Unit Test: 1. Enter the admin account. 2. Create a test user account 3. Elevate the access level of the test user. 4. Test the logs.

### 3.7 Automated Services

#### 3.7.1 Description and Priority

The data this system receives is used to inform many research groups. Removing the human element from this chain allows the system to work more consistently and reduces the chances of human error in the way of sending old data or forgetting to check for new data.

#### 3.7.2 Functional Requirements

REQ-F.7.1: The system will have basic automated data processing - PRIORITY: High

* The system will evaluate new observations to produce a reliability score for observation and update the reliability score of the user who submitted the observation. The reliability score for the observation shall incorporate the based on the confidence ranking submitted by the user, similar reports that may corroborate the observation, and the reliability score of the user.
* Observations that exceed a configurable reliability score will be automatically sent to the WRAS system.
* Rationale: System receives many observations. Observations from reliable sources are the primary priority of the CSN researchers.
* Test Scenario:
  + TEST-F.7.1: Unit Test: 1. Create an observation 2. Test for the reliability score to be generated

### 3.8 Functional Requirements Traceability Matrix

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature #** | **Feature Name** | **Req. #** | **Req. Name** | **Test Cases** |
| 1 | User Login | F.1.1 | User Create Account | TEST-F.1.1, TEST-F.1.2 |
| F.1.2 | User Reset Password | TEST-F.1.4 |
| 2 | Report Portal | F.2.1 | User Report Form | TEST-F.2.1 |
| 3 | Public Website | F.3.1 | Accept User Donations | TEST-F.3.1 |
| F.3.2 | CSN Service Information | TEST-F.3.2 |
| 4 | Data Storage | F.4.1 | Data Collection | TEST-F.4.1 |
| F.4.2 | Data Redundancy | TEST-F.4.2 |
| 5 | Data Access | F.5.1 | Data Egress Points | TEST-F.5.1 |
| 6 | User Management | F.6.1 | Employees Authorize Users | TEST-F.6.1 |
| F.6.2 | Admin Edit Access Levels | TEST-F.6.2 |
| 7 | Automated Services | F.7.1 | Basic Automated Data Processing | TEST-F.7.1 |

## 4 External Interface Requirements

### 4.1 User Interfaces

The user must be able to input data as well as any credential information for the system to identify the user. Whale data collection is central to the system, and identifying information is necessary to determine the reliability of a user and the data that they input to the system.

The client must have data access. User database permissions will be distributed using the concept of least privilege, and ensure that identifying information about users cannot be exposed to unauthorized parties.

Graphical user interfaces must meet the Web Content Accessibility Guidelines - version 2.0 (WCAG 2.0). Components such as font, font size, and contrast should match or exceed existing standards for accessibility determined by the type of graphical interface (web app, mobile app, etc)

Types of software components needed for the required user interface include text and numeric input fields as well as buttons. Implementation of an input field to record longitude and latitude is also required by the client.

### 4.2 Hardware Interfaces

The data input software shall be able to passively access the reporter's GPS location (with permission from the user) to improve the data’s accuracy. However, GPS location data shall not be a requirement for the system operations.

For any information or data collected by the software product and is stored physically on a device hardware component, this information or data should be secure. Unauthorized parties may not access, delete, or otherwise tamper with data stored on a physical hardware component.

### 4.3 Software Interfaces

The system will have the following software interfaces:

**Input Interfaces:**

* Create Observation Request
  + The system receives all the data for a new observation, including the email (or username) of the user that submitted the observation. This data is passed through the reliability score generator, and then the data and the reliability score will be stored in the main database’s observation table. A “Reponse to Create Observation Request” will be returned to the user.
* Login Request
  + The system receives an email (or username) and password pair, queries the main database’s user table for the password salt and hashed password for the relevant user, uses the password salt and submitted password to verify the user. Returns a “Response to Login Request”.
* Password Reset Request
  + The system receives an email (or username), and returns a “Response to Password Reset Request”.
* New Password Request
  + The system receives an email (or username), the old password and the new password. If the old password matches (after being hashed with the relevant salt) the hashed password stored in the main databases’ user table, the new password is salted and its hash replaces the hash of the old password in the user table.
* Data Request
  + The system receives an email (or username) and password, or user identification key, and verifies this information using the main database’s user table. A “Response to Data Request” is returned.
* Change User Authorization Level Request
* The system receives an email (or username) and password (to verify the user making the request) and an email (or username) and new authorization level pair to identify which user should be given which authorization level.

**Output Interfaces:**

* Message to WRAS System
  + The system will send a message to the WRAS whenever a new observation meets or exceeds the minimum reliability score for an observation. This message will include time, date, location, and details on what was observed.
* Response to Data Request
  + The system will return the requested data, or a message saying either the user could not be verified, or the user does not have the required authorization to access the requested data, as appropriate.
* Response to Login Request
  + The system will return either an identification token, such as a cookie, that will allow the user to use the system, or a message saying the login failed, as appropriate.
* Response to Password Reset Request
  + The system will return a confirmation or failure message as appropriate.
* Response to Create Observation Request
  + The system will return a confirmation or error message as appropriate. The confirmation message shall include a thank you to the user, and information on how many other observations have been made that day.
* Response to Change User Authorization Level Request
  + The system will return a confirmation or error message as appropriate. If the change was successful, the system will send a notification email to the user whose authorization level was changed with information on their new authorization level.

### 4.4 Communications Interfaces

For the reporting portal, the system will need to process electronic forms to allow users to create observations. It should also have some email communication function (or a reasonable alternative) to accept observations, as the current system uses email communication as an acceptable format for observation.

Additionally, there will be an interface to allow CSN employees and authorized partners to access the stored observations data.

## 5 Other Non-Functional Requirements

### 5.1 Performance Requirements

### 5.1.1 Description and Priority

High performance is important given the large scale of the system and different stakeholders involved.

### 5.1.2 Non-Functional Requirement

REQ-NF.1.1: System is accessible within 2 seconds - PRIORITY: Medium

* It shouldn’t take an average British Columbian (assume internet download speed: 34.5 Mbps) more than 2 seconds to load the webpage, or a page in the mobile app, 95% of the time.
* Rational: In web systems, loading time beyond 2 seconds typically leads to the abandonment rates of up to 87% (S. Anderson, 2020) which is unacceptable.
* Test Scenario:
  + TEST-NF.1: A group of 10 beta testers will use a testing version of application for a period of a week. The testing version application will gather data on:
    - Response time of servers
    - Availability of servers

REQ-NF.1.2: System can store all data likely to be required in the future - PRIORITY: High

* CSN currently has collectes 22 years worth of data. Based on client specifications the upgraded storage solution must have enough allocated resources to support at least 3 times the current amount of stored data (this amount is currently undisclosed by the customer).
* Rational : the amount of data that CSN collects is increasing, and we expect this system to be in place for at least as long as the current system has been in place.
* Test Scenario :
  + TEST-NF.2: Look at the amount of data currently stored in the database, times this by 3 and ensure the amount of available storage in the new system is at least that number

REQ-NF.1.3: Server Availability - PRIORITY: Low

* The system should have 99.9% availability.
* Rational : System uptime must be high enough to not feel inconsistent to the users.
* Test Scenario :
  + TEST-NF.1: See definition in REQ-NF.1.1.

### 5.2 Security Requirements

### 5.2.1 Description and Priority

Keeping the database secure is a medium priority because there is little to no sensitive information gathered. Data integrity and validity is a high priority, as it is used by many parties and loss of data would be detrimental to current and future projects.

### 5.2.2 Non-Functional Requirement

REQ-NF.2.1: Data Redundancy - PRIORITY: High

* The system uses a storage system that provides a mean time to data loss of at least 300 years, calculated using the “Canonical MTTDL Method” described by Greenan, Plank and Wylie (2010).
* Rational : Data loss would negatively impact the services provided by CSN. A MTTDL of 300 means that it is extremely unlikely that large amounts of data would be lost.
* Test Scenario :
  + TEST-NF.3: the system is checked to ensure that its mean time to data loss is at least 300 years, calculated using the “Canonical MTTDL Method” described by Greenan, Plank and Wylie (2010).

REQ-NF.2.2: PCI Compliant Payment System - PRIORITY: High

* The new system shall ensure that the way all donations are handled is compliant to the PCI Standards.
* Rational : CSN needs to ensure that credit card payments are processed in accordance with best practices and Canadian law.
* Test Scenario :
  + TEST-NF.4: The system used to handle credit systems is checked to ensure that it has passed a PCI Audit.

REQ-NF.2.3: User Authentication - PRIORITY: High

* The system shall ensure that only specific users will be given write access to the database and that the policy of least privilege is followed when assigning user database permissions.
* Rational : CSN is concerned that giving the public access to real time information could lead to negative impacts on marine life.
* Test Scenario :
  + TEST-NF.5: 10 user accounts are created and the following steps are repeated 15 times per account:
    - The account is assigned a new random access level
    - The account checks that it is allowed to access 3 different bits of information that are allowed at that access level.
    - The account checks that it is not allowed to access 3 different bits of information that are not allowed at that access level.

### 5.3 Software Quality Attributes

### 5.3.1 Description and Priority

The system is required to meet certain thresholds that relate to software quality attributes to ensure the system is easily usable, visually appealing and keeps their attention.

### 5.3.2 Non-Functional Requirement

REQ-NF.3.1: Accessibility - PRIORITY: Medium

* The system needs to be compatible with reading programs, such as JAWS, to allow its use by the audibly impaired.
* The system needs to be compliant with WCAG version 2.0.
* Rational : As CSN receives funding from the federal government, it needs to ensure that its services are accessible.
* Test Scenario :
  + TEST-NF.6: The system is used by two testers using JAWS, and the ability for them to create an account, log in, log out, and submit a report, is tested.
  + TEST-NF.7: The system is used by two testers who are familiar with WCAG 2.0, and the users create an account, log in, log out, and submit a report. The test passes if they do not notice any components that do not meet WCAG 2.0

REQ-NF.3.2: Usability - PRIORITY: Medium

* The system needs to comply with the Government of Canada’s Standard on Web Usability (Government of Canada, 2013) and Web Content Availability Guidelines (W3C, 2008)*.*
* A manual will be produced for the CSN staff to help them to quickly learn how to use and manage the new system. There will also be training sessions provided during the initial handover period to help with the learning process
* Rational : It’s important for the system to be mostly intuitive to prevent user induced errors.
* Test Scenario :
  + TEST-NF.8: After receiving training CSN staff will be asked to complete a series of tasks. They will be monitored discretely and their actions recorded for later analysis. After they complete the task they will be asked a series of questions about the experience such as their general thoughts and more direct questions about steps that seemed to cause them issues or confusion

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature #** | **Feature Name** | **Req. #** | **Req. Name** | **Test Cases** |
| 8 | Performance Requirements | NF.1.1 | System Accessibility | TEST-NF.1 |
| NF.1.2 | System Storage | TEST-NF2 |
| NF.1.3 | Server Availability | TEST-NF1 |
| 9 | Security Requirements | NF.2.1 | Data Redundancy | TEST-NF3 |
| NF.2.2 | PCI Compliant Payment System | TEST-NF4 |
| NF.2.3 | User Authentication | TEST-NF5 |
| 10 | Software Quality Attributes | NF.3.1 | Accessibility | TEST-NF6,  TEST-NF7 |
| 11 | Software Quality Attributes | NF.3.2 | Usability | TEST-NF8 |

## 6 Other Requirements

### 6.1 Language Requirements

### 6.1.1 Description and Priority

The costs of the WildWhales reporting system is partially covered by the Government of Canada. Therefore, content on the system should be provided in both English and French.

### 6.1.2 Requirement

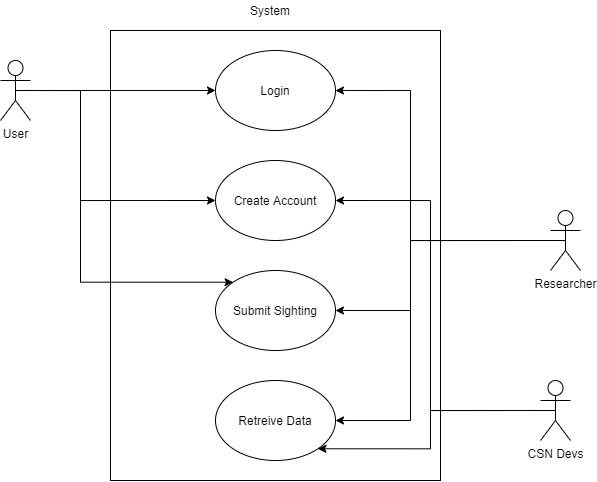
REQ-G.1.1: French Language Accessibility - PRIORITY: Low

* The system shall offer both an English and French interface, and updates to the system will publish French and English versions at the same time
* Rational : To provide greater access to users and to comply with general Federal Government access standards for partners.
* Test Scenario :
  + TEST-G.1: Bring in french language expert and have them review all the text on the website/app for proper grammar and meaning.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Feature #** | **Feature Name** | **Req. #** | **Req. Name** | **Test Cases** |
| 12 | Language Requirements | G.1.1 | French Language Accessibility | TEST-G.1 |

## 

## 7 Use Case Models



### 7.1 User Creates an Account

### 7.1.1 Use Case Name

User Creates an Account

### 7.1.2 Description

This use case describes how the reporter can create an account

### 7.1.3 Actors

User, WildWhale Reporting System

### 7.1.4 Pre-Conditions

The User has a device with internet access and has an email that is not currently associated with an account in the WildWhales Reporting System.

### 7.1.5 Main Flow

1. The use case begins when the user accesses the CSN Landing webpage
2. The User clicks on ‘Create an Account’ button
3. The System prompts the user for them to enter an email and enter their password twice.
4. The User enters information into the three fields and submits the information.
5. **<System Authenticates New User>** The System ensures that the passwords match, that the email is a properly formatted email address, and the no account already exists for that email.
6. **<Account Creation>** The system informs the user that the new account has been created and takes the User to the Login page.
7. The Use Case ends

### 7.1.6 Post-Conditions

A new account exists on the WildWhale Reporting System.

### 7.1.7 Alternative Flows

From the Landing page, the User selects ‘Submit Report’, then:

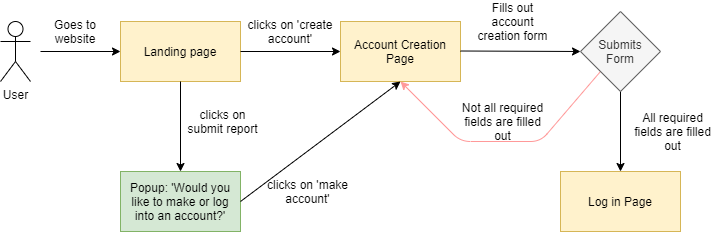
1. Popup appears asking them if they want to log in, create an account, or submit an observation without an account.
2. The User selects ‘Create Account’

Return to step 3 of the Main Flow.

At **<System Authenticates New User>**, if the email already has an account associated with it, the email is improperly formatted, and/or the passwords do not match, then:

1. The System displays the errors next to the relevant field(s)
2. The User enters new information into those fields, and resubmits the information.

Return to **<System Authenticates New User>** in the Main Flow.



**Figure 1**. Use Case Model: Creating a New Account

Figure 1 displays the use case for creating an account in a visual form. Both main and alternative flows are displayed. Every arrow corresponds to the step in the use case. Rectangles represent the pages.

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**Figure 2**. UI Prototype: Creating an Account

Figure 2 displays an initial prototype for the use case. Below is the breakdown of each page in the main flow:

**1.0 - Home Page:** the landing page of the system.

**2.0 - Account Creation**: the page opens when the user clicks create an account on the home page.

**3.0 - Login Page**: the final step of the use case, where the user can log into the application

The pages involved in the alternative flow are:

**1.1 - Submit Popup:** the pop-up gets displayed when a user clicks ‘Submit Report’ without being logged in.

**2.1** **- Account Creation Password Error:** This page is displayed when the user tries to create an account, but the passwords do not match.

**2.2 - Account Creation Email Error:** This page is displayed when an error is caused by an invalid email being entered in the Account Creation page. The error message shown indicates that the user did not enter any input.

### 7.2 User With Account Submits a Sighting

### 7.2.1 Use Case Name

User With Account Submits a Sighting

### 7.2.2 Description

This use case describes how a User creates an observation in the WildWhales Reporting System.

### 7.2.3 Actors

User, WildWhales Reporting System

### 7.2.4 Pre-Conditions

The User has an account with WildWhales Reporting System, knows their authentication information, and has a device with internet access.

### 7.2.5 Main Flow

1. The User opens the WildWhales Reporting System.
2. The User navigates to the login page.
3. **<Enter Username and Password>** The User enters their username and password.
4. **<User Authentication>** The system authenticates the User and returns the User to the homepage.
5. The User navigates to the ‘Submit a Sighting’ page.
6. The User enters information about where and when they saw a cetacean and/or sea turtle and the weather.
7. **<Species Identification>** The User selects the species of cetacean or sea turtles that they saw.
8. The User selects their confidence level on the accuracy of their identification of the species.
9. The User clicks a submit button and the system receives all the information entered by the user.

### 7.2.6 Post-Conditions

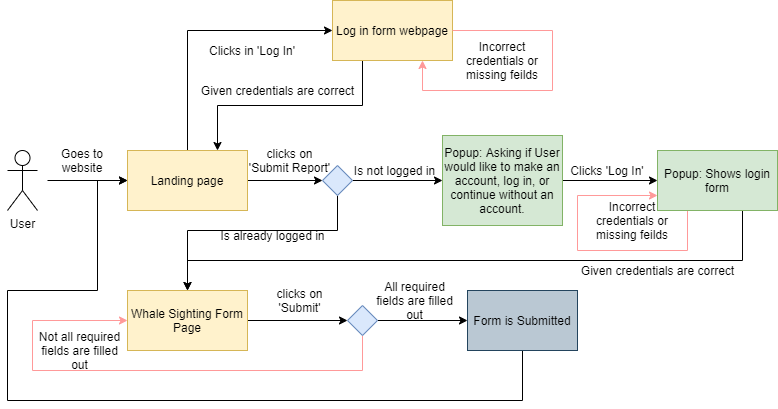
A new observation is sent to the WildWhales Reporting System.

### 7.2.7 Alternative Flows

At **<User Authentication>**, if the User entered the wrong authentication information, then:

* The System displays a messages saying "Incorrect username or password"
* The system displays the field for entering the authentication information again.

Return to **<User Authentication>** in the Main Flow.



**Figure 3**. Use Case Model: User with Account Submits a Sighting

## 8 Data Flow Diagrams

### 8.1 Level-0

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### 8.2 Level-1

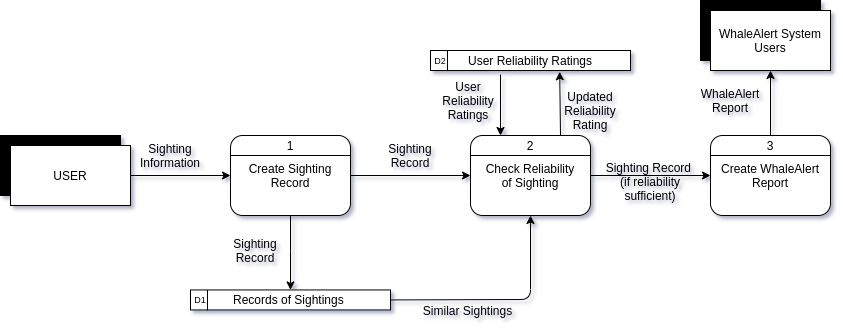
#### 2.1 Creating User Accounts

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#### 2.2 Research Partner Accessing Data

### 

#### 2.3 Create a Sighting



## Appendix: Issues List

Ongoing issues to be discussed with the client and relevant stakeholders are:

* The amount of data the current system contains, the current rate of growth of the stored data, and expectations for the length of time that this new system will be used for (to create a requirement for how much data this new system will be expected to hold).
* The level (and method) of integration between this system and the WRAS system.
* The budget for the development of the new system, and a budget for ongoing operational costs, must be created.