Wildlife Insights Platform Feature Build-out, Support and Maintenance

Request for Proposals

Invitation:

Conservation International Foundation (CI), on behalf of the Wildlife Insights partners, invites proposals from suitably qualified contractors to maintain and continue the development of the core platform infrastructure for Wildlife Insights - a global wildlife monitoring platform - and support the development of new features as described in this document. Recipients of this document are invited to submit a proposal in compliance with this Request for Proposals to undertake the scope of work described herein. Proposals will be reviewed as received and a contract issued as soon as a qualified, competitive contractor and proposal is identified.

Submission:

Final proposals should be submitted by March 2, 2020 at 5pm EST to Nicole Flores (nflores@conservation.org). Contractors should be prepared to start work no later than March 16, 2020. It is anticipated that the assignment will take approximately one (1) year, not to exceed the final deadline of March 16, 2021.

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1. Wildlife Insights Background.

The use of camera traps to monitor wildlife has benefitted from recent technological advances, allowing researchers to collect enormous amounts of data on wildlife with minimal effort. These advances have turned camera trapping into a “big data” science, opening the doors to incredible new knowledge but also introducing serious technical challenges that threaten to limit its impact. Most camera trap data collected today are not effectively analyzed or shared, and millions of wildlife images are scattered across computers, hard drives, and repositories around the world - in danger of being lost forever.

Wildlife Insights (WI) is a new platform designed to address these barriers by accelerating data processing with artificial intelligence species identification models and providing tools to easily analyze and share wildlife data. WI aims to enable better conservation decision-making, investments, and actions, ultimately resulting in stable and recovering wildlife populations and healthier ecosystems.

Wildlife Insights is being developed through a core partnership between Conservation International, the Smithsonian Institution, the Wildlife Conservation Society, the North Carolina Museum of Natural Sciences, WWF, Map of Life, the Zoological Society of London and Google.

2. Project Background.

a. Project Goal

Wildlife Insights partners and developers have built a minimum viable product (MVP) that enables users to upload camera trap images, run images through artificial intelligence species identification models, review and edit identifications, download data, create initiatives to share data between organizations, create custom web pages for initiatives, assign roles and permissions, and share their data with the public, all in the cloud-based WI platform.

For WI to reach its full potential, we will continue to build features and tools needed most to better manage and share camera trap data. This project will focus on building features to fulfill the needs for three audiences: large land conservancies, government agencies and private corporations. We intend to work side by side with representatives from each of these audiences to understand user requirements. We expect the development process will be iterative, with a Google UI/UX team leading design and user testing sessions and the chosen contractor implementing based on feedback collected.

b. Target Audiences

Wildlife Insights anticipates that its products and services are important for many key target audience groups. The scope of work proposed for this contract will focus on three of these key user groups:

- **Large land conservancies** (both public protected area and private land managers) that need a solution to effectively manage wildlife data across organizations, understand threats and assess the impact of their actions.
- **Private corporations** that have responsibility to monitor their impact on key ecosystems to satisfy their internal business, financial and regulatory drivers.
- **Government Agencies** that are already heavily invested in using camera traps and sensors for wildlife projects.

c. Project Timeline

We plan to present the platform to the general public at the IUCN World Conservation Congress which will be held from June 11-19, 2020. The World Conservation Congress, which is held every 4 years, is the largest convening of conservation organizations in the world and a key opportunity for Wildlife Insights. To meet this milestone, we will continue developing additional features, as described below.

Beyond the IUCN congress, we will continue to engage with our priority user groups to understand their needs for managing and sharing camera trap data. Our priority is to begin building case studies to demonstrate the potential of Wildlife Insights in advancing data driven wildlife conservation.

3. Scope of Work - High Level Guidance

Conservation International serves as the Secretariat for WI and will serve as the primary contact for the chosen contractor. The contractor can also expect to work closely with members from the Google UI/UX team, which is responsible for designing and testing. Core partner organizations and partners on the Google AI team may also interact with the contractor on an as needed basis.

In this phase of development, we expect users to request features that accelerate the existing data management workflow and provide additional value to their datasets. This may involve significant design updates and the inclusion of additional graphs and analytics.

With a Google UI/UX team leading the design of new features and user testing, we are looking to contract a strong engineering team with demonstrated experience in backend development, cloud environments, APIs, and proven ability with NodeJS and graphQL.

Guiding Principles

The initial high-level guiding principles of WI include:

- A clear and open technology roadmap (akin to open source software community driven efforts) that is driven by the communities and audiences we are targeting;
- Open access and attribution for data providers and users driven by standard data provider and user terms of use;
- A modular and agile approach with products and services built to be scalable and maintainable from the outset (e.g., using software containers);
- Ensured scalability to manage thousands of users simultaneously;
- Purpose-built to ensure stakeholders utilize the products and services they need;
- Secure in both backup and data sensitivity. All cloud-based applications will utilize standard backup procedures with the Smithsonian AWS Glacier account serving as redundant backup (an opt out clause will be available for data providers who demonstrate an acceptable archive plan);
- Following best practices to ensure long term maintainability of a large and complex codebase. This includes documenting coding standards and adopting portable practices.

Documentation

The Contractor is expected to continue building on existing documentation that clearly explains how to install, configure, build, maintain, troubleshoot and otherwise utilize all WI components. Any new features or changes should be clearly documented using proper versioning. Documentation should occur at many levels including: comments in the code and functions, github readme files and overall architectural documentation connecting software components together.

3a. Scope of Work - Maintenance and Support.

The contractor will provide overall maintenance and support for existing WI platform components, which are described in detail in Appendix 3.

Severity and Response Time Objectives

As part of the maintenance and support responsibilities the contractor should be able to meet the Severity and Response Time Objectives table below or propose an alternative approach that meets the needs described. Response Time Objectives are completed when a resolution is successfully implemented. Please be sure to include your standard business hours with respect to Severity and Response Time Objectives. Lastly, our response times are indicative of what we would like to see. If there are significant costs (up or down) by increasing or decreasing the response time, please let us know.

Severity classification	Definition	*Response Time Objectives	Notes
Severity level 1	Critical: production system is down	8 hours	The marketing website, the WI application or API are unusable resulting in a total disruption of work or other critical impact on operations. Newly received cases will be assessed through discussions with the customer to confirm that they fulfill the criteria, and may be downgraded in priority if they do not
Severity level 2	Serious: major feature or function failure	1 business day	Operations are severely restricted. A workaround may be available
Severity level 3	Medium: minor feature or function failure.	2 business days	The product does not operate as designed or as it was prior to the issue date. There is a minor impact on usage, and an acceptable workaround is deployed.
Severity level 4	Low: minor problem	5 business days	This can be classified as a request for documentation, general information, and minor enhancement request.

**Response Time Objectives for issues submitted outside standard business hours will apply to the next business day.*

Role of Wildlife Insights and Issue/Feature Tracking

Wildlife Insights staff will serve as the first point of contact for WI data providers and users. WI staff will initially review all incoming bugs and feature requests coming from users in any form (info@wildlifeinsights.org, phone calls, in-person conversation, video conferencing software, etc). WI staff will screen out software issues and bugs and share them, with severity levels, to the contractor. An issue tracking system (e.g., Microsoft Pivotal Tracker, JIRA Software) will be used to track and resolve all issues. WI staff will communicate back to WI data providers and users unless it makes more sense (e.g., an iterative conversation is needed on a very technical API issues) for the contractor to be in direct contact with them.

3b. Scope of Work - New Feature Requests.

Wildlife Insights will be feature demand-driven with an unknown number of feature requests coming from our priority users: major land conservancies, government agencies and private companies. To understand the specific needs for each priority user group, we anticipate conducting two to three phases of user testing and feedback sessions within the duration of this contract.

Role of Wildlife Insights and Google in developing new features

The Google UX/UI team will lead the design, testing and validation of new Wildlife Insights feature requests. As part of this process, the Google team will draw from user feedback to create designs for new features. The Google and WI team will then conduct usability studies with priority user groups, provide recommendations for design improvements, iterate to improve designs, and finally hand off validated designs to the contractor for implementation.

The WI team and the contractor will collaboratively scope, bid and prioritize feature requests based on recommendations from the Google team. We envision the agile approach will follow a workflow similar to the approach outlined below. This approach will require close coordination between the chosen contractor, the Google UI/UX team, and the core WI team.

Led by Google & Wildlife Insights team

- **Design:** The Google team will design high priority new features based on user feedback.
- **Test:** Once a group of new features have been designed, Google UX researchers and the WI team will plan a virtual or in-person testing session with priority users to identify design or usability issues.
- **Iterate**: After each testing session, the Google team will iterate and improve designs. Once designs have met agreed upon criteria, the Google team will hand off designs to the contracted engineering team to implement.

Led by Contractor

- **Scope:** The contractor should map out the specific requirements required to implement new feature requests proposed by the WI and Google team.
- **Bid**: The contractor will be expected to justify the hours required to complete each feature or component prior to software development beginning.
- **Prioritize**: The WI team will prioritize new features based on the feasibility of implementation, Google UI/UX recommendations, impact on user experience, the contractor's bid, and how the feature aligns with the overall platform development strategy.
- **Build**: New features will be implemented by the contractor in the Wildlife Insights staging environment.

- **Deploy**: New features that have been tested in the staging environment and approved by the WI team will be deployed to the production environment.

3c. Scope of Work - Known Components and Feature Requests.

The WI team has collected feedback from user testing sessions held over the past year and has amassed a list of feature requests that were not implemented as part of the MVP. The contractor will be expected to begin implementing known feature requests described in Appendix 1a upon the contract start date. Known feature requests listed in Appendix 1b will require a design, test and iterate approach led by Google before the contractor begins implementation.

3d. Scope of Work - Wildlife Insights Artificial Intelligence model support.

The Contractor is responsible for ensuring that updated models provided by Google are integrated seamlessly into the Wildlife Insights platform. This may entail modifying the parameters shared and retrieved from the computer vision model. This work may impact several components in WI including the API, database and front-end design.

4. Instructions for Proposal Preparation.

a. Proposal Submission Timeline

RFP Announcement	February 5, 2020
Final Proposal Submission Deadline	March 2, 2020
Project start date	March 16, 2020

The dates above may be modified at the sole discretion of CI.

b. Cover Note

Applicants should include a cover note to their proposal listing all documents submitted. The cover note should clearly list the name of the organizational chief executive, and, if different, the name(s) of all parties with the ability to legally bind the organization and the name(s) of all parties whom Wildlife Insights should contact for clarifications and negotiations. The cover note should also provide a complete mailing address, street address (if different), electronic mail address(es), and telephone numbers.

c. Organizational Capabilities

Applicants should provide documentation that provides evidence of the ability to complete the tasks described in the scope of work. This should include, at a minimum:

1. Basic organizational information, including: year organization established, total permanent staff, and organizational history and mission statement.
2. Relevant experience in developing and implementing IT systems and applications for university and/or non-profit organizations.
3. Relevant experience building graphs, charts and maps.

d. Curricula Vitae of Key Personnel

Applicants must identify, by name, the team leader and any other additional individuals who will work on this project. Please include a list of FTEs that will be made available for support and maintenance work as well as staff available for feature development. Sub-contractors during the contract period will not be permitted unless explicitly agreed upon. The Contractor must have project staff with strong experience in building and using web services and building graphs, charts and maps, as we expect this will be a common feature request by users.

e. Work Plan, Timeline and Deliverables

Proposal responses should be divided into four Scope of Work sections: Section 3a - Support and Maintenance, Section 3b - New Feature requests, Section 3c - Known Components and Features, and Section 3d - Wildlife Insights Artificial Intelligence model support, which are described above. Contractors should include the following in their application:

1. A proposal to ensure the Severity & Response Time Objectives are met, either following the outlined table in Section 3a or proposing an alternative approach.
2. A proposal to manage the process to build new features as described in Section 3b.
3. A timeline for completing the known features described in Section 3c & Appendix 1a.
4. A proposal for periodic (i.e., weekly) meetings to ensure close communication with the WI team, the Google UI/UX team and the engineering team. Weekly meetings can be scheduled separately with the WI team and the UI/UX team or jointly.

f. Budget

Applicants must submit a budget in a functioning Microsoft Excel/Google Sheet file and a brief companion narrative. Please provide cost estimates or hourly rates for each Scope of Work segment according to the details below:

- 3a (Support and Maintenance): Please provide hourly rates for support and maintenance in line with the Severity and Response Time Objectives.
- 3b (New Features): Please provide hourly rates for building new features as described above in Section 3b. As detailed, each new feature will be bid on prior to development beginning.

- 3c (Known Components and Features): Please provide anticipated level of effort and cost for implementing each known feature listed in Appendix 1a. Features listed in Appendix 1b will be scoped and bid on prior to development.

If selected, Offeror shall use its best efforts to minimize the financing of any taxes on goods and services, or the importation, manufacture, procurement or supply thereof. If Offeror is eligible to apply for refunds on taxes paid, Offeror shall do so. Any tax savings should be reflected in the total cost.

g. Evaluation Criteria

CI will consider all submitted responses and will make a best value determination of proposals in relation to proposed budgets. CI reserves the right not to make an appointment from this RFP. All applicants will be notified whether their application was accepted or not.

Evaluation Criteria:

- Organizational Capabilities (20 points)
- Portfolio of Past Work (20 points)
- Personnel Qualifications (20 points)
- Work Plan and Timeline (20 points)
- Cost (20 points)

All Offerors are expected to exercise the highest standards of conduct in preparing, submitting and if selected, eventually carrying out the specified work in accordance with CI's Code of Ethics.

Conservation International's reputation derives from our commitment to our values: Integrity, Respect, Courage, Optimism, Passion and Teamwork. CI's Code of Ethics (the "Code") provides guidance to CI employees, service providers, experts, interns, and volunteers in living CI's core values, and outlines minimum standards for ethical conduct which all parties must adhere to.

Offerors are required to sign a representation of Transparency, Integrity, Environmental and Social Responsibility.

Any violation of the Code of Ethics, as well as concerns regarding the integrity of the procurement process and documents should be reported to CI via its Ethics Hotline at www.ci.ethicspoint.com.

This RFP does not obligate CI to execute a contract nor does it commit CI to pay any costs incurred in the preparation or submission of the proposals. Furthermore, CI reserves the right to reject any and all offers, if such action is considered to be in the best interest of CI.

Appendix 1a: Known feature requests that can be built upon contract start.

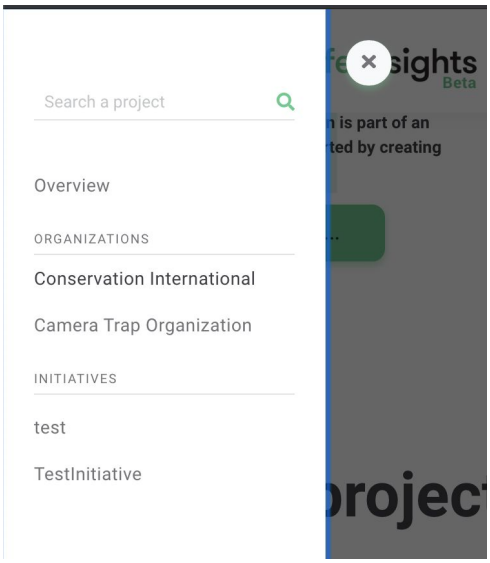
1. **As a user, I want to use shortcut keys so that I quickly sort images and identify common species.**
   [WI goal met: accelerating data processing]
   Shortcut keys should be programmed for common tasks including: flipping back and forth between images, flipping between sets of bursts, and selecting an identification for a common species in a project. Shortcut keys for common species should be configurable by the user within their account preferences.

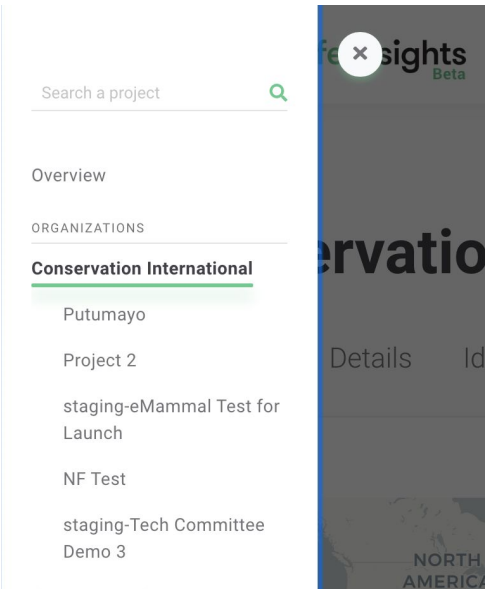
2. **As a user, I want to see personalized search results returned when editing an identification or filtering for taxonomy.**
   [WI goal met: accelerate data processing]
   The current search rankings do not have a clear logic, which makes it hard for users to understand why they see the results they're seeing. For example, when typing a search string, results that begin with that string are not always shown as a top result. Additionally, users expect to see personalized results based on their previous searches, existing identifications and location. We wish to implement smarter search results that recognize search history, commonly chosen identifications, and better matches to the string entered.

3. **As a user, I want to select multiple files while viewing images in thumbnail view so that I can perform bulk actions.**
   [WI goal met: accelerate data processing]
   Users may be able to identify images in the default thumbnail view without opening a larger lightbox view of an individual image. Currently, the user can select multiple images by clicking on each individual image. They can then perform an action, like assigning an identification or highlighting the images. However, clicking on each individual image can be tedious. To increase the efficiency of selecting multiple images, options for selecting multiple files should be implemented. This includes:
   - Ability to click and drag to select a group
   - Selecting the first image and then selecting the last while holding Shift + click to select all images in between
   - Add or remove images from a selection by holding Command + click (Mac) or Ctrl + click (PC)

4. **As a user, I want to view a list of all my projects so that I can quickly navigate between workspaces.**
   [WI goal met: intuitive navigation]
   The current build includes a collapsible tab that allows users to search for projects while signed in to their account. However, when first opening the tab, the user only sees a list of Organizations and Initiatives that they have access to (see left screenshot below). Once one of these entities is selected, the tab automatically collapses. The desired behavior is for the user to be able to quickly see a list of projects (see right screenshot) without needing to reopen the tab.

   An improved search tab will require implementing the changes listed below:
   - Organizations and Initiatives should be manually collapsible so that the user can see a list of nested projects that they have access to;
   - If a user has any role in a project, they should be able to see the parent organization listed in the project tab;
   - If the user does not have permissions to a parent entity, the parent entity text should be an inactive link. If the user does have permissions to the parent entity, the parent entity text should be an active link.





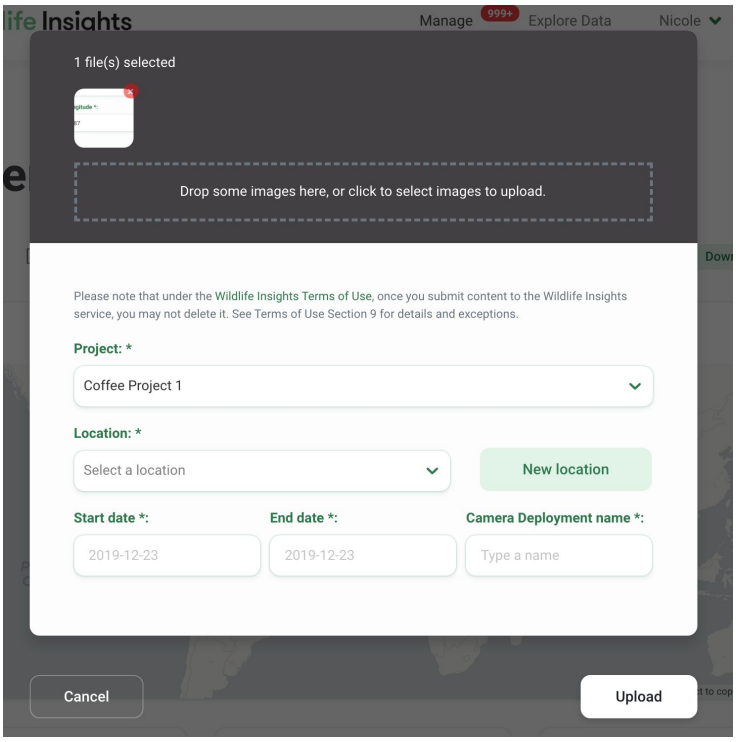
5. **As a user, I want to make my data private from any public page in Wildlife Insights so that my project is in compliance with national or local legislation.**
   [WI goal met: data privacy]
   By default, all data in Wildlife Insights will be made publicly available on the *Explore Data* page, where users can view projects, filter data, and eventually will be able to download data. Wildlife Insights allows exceptions for sensitive data (i.e., images of humans, locations of sensitive species) and embargoed data so that these data will never be made completely public. In these cases, the public *Explore Data* page will still reveal some indication that a record of the sensitive or embargoed data exists (i.e., a record of a human with no image, blurred location data for sensitive species, and basic project details but no data for embargoed projects), though specific information is not revealed. However, some users may require their projects to remain completely private so that no information is shown on the *Explore Data,* not even a record of the project. This will require a flag in the database that indicates a project is "never public", which will keep the project completely private from the *Explore Data* page.

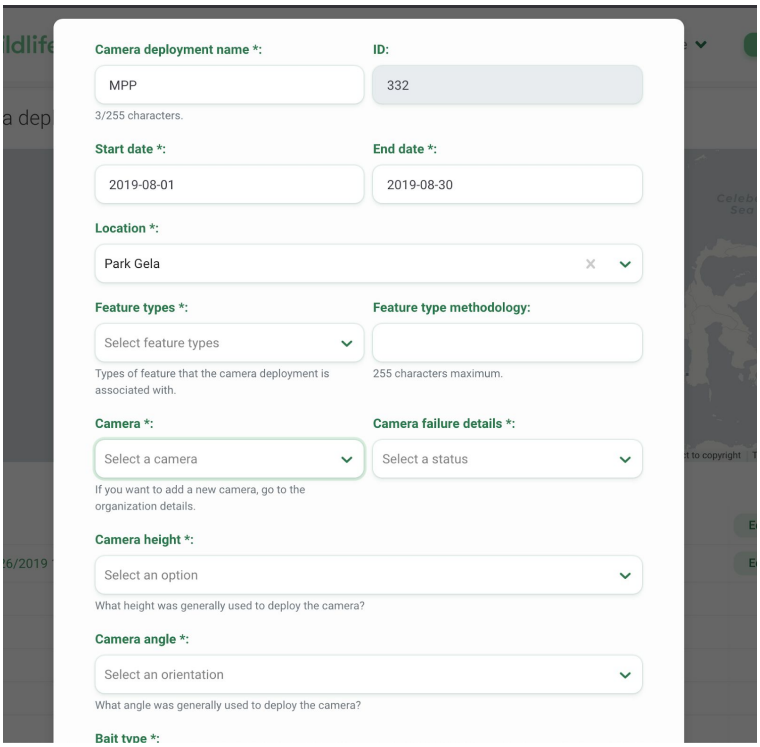
6. **As a user, I want to follow my organization's naming conventions for new projects so that I can ensure my projects are standardized.**
   [WI goal met: standardized data management]
   Currently, project names must be globally unique within the Wildlife Insights database. However, it may be likely that multiple organizations will want to name their own projects using the same name. The globally unique constraint would result in many project names with meaningless suffixes. We wish to alter the globally unique project name constraint so that project names are only required to be unique within an organization. This will require changes in several parts of the application including the API and altering how project buckets are named in the backend. For example, the project name is currently used to name buckets. We will need to add a UUID to the bucket name to ensure that each project is uniquely identifiable in the backend.

7. **As a user, I want to ensure that metadata is consistent within a project so that I have an accurate record of project details.**
   [WI goal met: standardized data management]
   Attributes across entities may have a dependent relationship in theory, but the dependency may not be implemented in the WI database. One existing theoretical dependency that needs to be implemented is the relationship between Bait Use (a project level attribute with response options of Yes, Some and No) and Bait Type (a deployment level attribute with a number of response options). Currently, a user can select No in the Bait Use field, but can then select a Bait Type option in a deployment within that same project. There needs to be a constraint that limits Bait Type entries within a deployment if the details in the parent project indicate that there is No Bait Use.

8. **As a user, I want to quickly create, read, and update all metadata fields associated with Projects, Deployments, Locations and Cameras so that my data is accurate and meets the Wildlife Insights data standards.**
   [WI goal met: standardized data management]
   This task will require several changes listed below:

   - **The user should be able to enter all required deployment information when uploading images and creating a new deployment.** The current UI was built to optimize the upload photo process. However, as built, there is a loophole that allows a user to create a deployment without entering required information. The left screenshot shows the Upload screen where a user can create a deployment without all required fields (i.e., the user only needs to enter the location, start date, end date and deployment name). The right screenshot shows the Deployment Creation screens that enables a user to enter all required fields, which are marked by an asterisk (i.e., name, start date, end date, location, feature type, camera, camera height, camera angle, bait type). The upload photo modal needs to be updated to close this loophole and include all required fields when a user creates a new deployment.



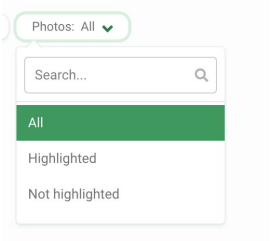


- **Require at least 3 decimal places for any location information submitted to Wildlife Insights so that the exact location is always submitted and users cannot manually obscure locations.** This will require changes to the: batch upload templates (can be done by WI), validation process and changes to UI

- **Add the ability for a user to create an individual deployment or individual location separately from the upload image process.** Currently, the user can only create a deployment and location while uploading images. In a Project's details, the user can edit existing deployments and locations but cannot create these entities.

- **Add Camera Make when creating a Camera.** Camera Make is accepted as a field in batch uploads but is not exposed in the UI. The field is not required, but should be available for users to enter this information in the front end.

9. **As a user, I want to flag images apart from highlighting them so that I can quickly reference sets of images that may need additional attention.**
   [WI goal met: data quality control]
   Users should be able to flag images (apart from Highlighting Images) and filter for flagged images. The meaning of a flagged image will be determined by the user.



10. **As a user, I want to manually refresh an entity's statistics so that I can instantly see the results of my work.**
    [WI goal met: rewards for data processing]
    As currently implemented, materialized views for project, organization, or initiative level operational statistics are refreshed every hour. To the user, it appears that the operational statistics are not being calculated or are malfunctioning if they're not updated automatically. We want to include an option to allow the project owner to manually refresh statistics after they've completed work so that they can see the results of their effort.

11. **API Tasks**
    - Stress test all aspects of the WI API: https://api.wildlifeinsights.org/swagger/#/, review documentation and implement an API monitoring tool.

Appendix 1b: Known feature requests that will need to be designed and tested (by Google team) before the contractor begins implementation.

The features listed below are known feature requests, but will require some user testing to validate the appropriate design. Upon the contract start, the Google team will begin designing and testing these features. The chosen contractor can expect to begin implementing these features after they are designed and tested.

12. **As an owner of an entity in Wildlife Insights, I want to manage my team and collaborators in a central control panel so that I can easily understand if my team has the right permissions for their projects.**
    [WI goal met: team management]
    Some data providers work with a number of collaborators across many projects. Currently, roles can only be assigned to one entity at a time (e.g. to one project, organization or initiative). A central control panel for managing and bulk editing user permissions across organizations, projects and initiatives is a need for many of WI's users.

13. **As a data user, I want to reference a unique persistent identifier for every dataset I use so that I can accurately cite my work.**
    [WI goal met: data sharing]
    Data users who download Wildlife Insights public data and use that information in their research should be able to cite a unique persistent identifier to reference datasets used in their work. Wildlife Insights will generate a DOI for each project which should be included in each data download file. The DOI should link to a public project page that provides a summary of the project (details to be defined). See an example DOI reference page at: https://doi.org/10.5067/Aura/OMI/DATA3005. Wildlife Insights will subscribe to this DOI Service to generate unique DOIs for every single project in Wildlife Insights. These DOIs need to be associated with each project (in the database) and will then be shared with users who download the project metadata.

14. **As a data owner, I want to know how my data is being used so that I can evaluate the impact of my work.**
    [WI goal met: data sharing]
    Data providers want to know who is using their data so they can measure impact, reach out for collaborations, and control usage of data. We'd like to establish a service that enables a data provider to opt in for data download alerts as an option in their project preferences. Alerts would be received by the user either within their account or as an email sent to the project owner when their data is downloaded by any user. Alerts should include a simple notification of the download, additional information about the data user (e.g., Name, email address, intended use), and an option to permit the release of location

information associated with sensitive species. Exact information to be included will be decided by Wildlife Insights partners.

15. **As a public user, I want to report images that are inappropriate.**
    [WI goal met: data quality control and data privacy]
    The Explore Data page currently displays images that are highlighted by the data owner. Any public user can view these images. As with any public image repository, there is a possibility that inappropriate images are displayed on this page and thus violate the Wildlife Insights Terms of Use. We need a feature (i.e., a button) that allows users to report individual images. The button should send an alert to the WI admin account or to info@wildlifeinsights.org.

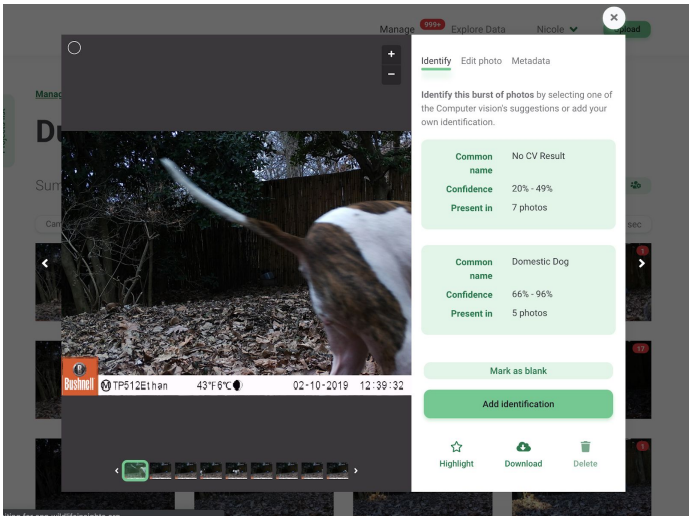
16. **As a user, I want to be able to flag and edit timestamps so that I can manually correct for camera malfunctions.**
    [WI goal met: data quality control]
    Occasionally the timestamp is set incorrectly in the sensor. As a result, users will need to be able to edit timestamps at the deployment level or individual level and flag the deployment as edited. The user should be able to shift the timestamp of all images selected proportionally to the timestamp recorded by the camera. The edited timestamps should be the timestamps used in calculating analytics.

17. **As a user, I want to upload my metadata for deployment, location and camera details in bulk so that I can spend less time managing data.**
    [WI goal met: quick uploads]
    Users often store deployment, location and camera metadata in excel/csv format prior to processing images. Currently in Wildlife Insights, users can only create a single deployment, location or camera at a time. In order to facilitate a more efficient metadata upload process, the contractor is expected to build a user friendly batch metadata upload tool for deployments, locations and cameras that accepts excel/csv files. The batch metadata upload should only accept metadata that meets the Wildlife Insights minimum metadata requirements, as indicated in Column G of each tab in the WI Batch Upload Template. The front end should also provide a download of or link to the batch deployment, location, and camera metadata upload template.

18. **As a user, I want to quickly add multiple animals of the same species to an identification so that I can decrease the time spent reviewing images.**
    [WI goal met: accelerate data processing]
    The first version of the AI model returns just one identification per image. Since camera trap images can capture multiple animals within one image, users will often need to manually add additional animals to an identification. This action should be quick and easy to replicate. As currently built, a user must type and search for the correct species for every additional individual added to an identification. We'd like to build a more efficient workflow for users to add an additional animal if that species has already been identified

in the image. For example, a user should be able to click just one button or use a shortcut key to add an additional animal. This feature will eventually need to be integrated with the computer vision model work plan to account for when the model will return bounding box and probabilities per animal/objected detected in the image.

19. **As a user, I want to understand how many images I've reviewed within a burst so that I can accurately identify images.**
    [WI goal met: accelerate data processing]
    When a user views images in "burst" mode, they see a preview of 9 images at once (see screenshot to the right). If there are more than 9 images, there is no way for the user to know how many images they've already seen in the burst and how many are left to review. A counter for tracking images shown in "bursts" would help the user sort through burst images.

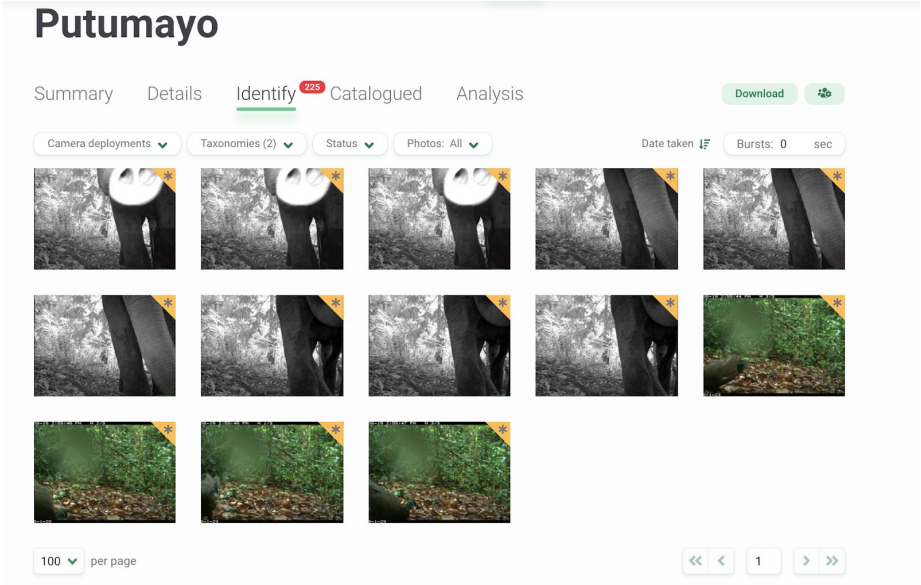


20. **As a user, I want to apply a longer burst setting so that I can view image sets with the same species.**
    [WI goal met: accelerate data processing]
    The burst setting currently limits the selection to a maximum of 120 seconds. Some users may want to set a longer burst interval. For example, animals may tend to linger at baited cameras and may set off the camera at intervals greater than 120 seconds.

21. **As a user, I want to see larger image previews while in thumbnail or burst view so that I don't have to open each image to verify the ID.**
    [WI goal met: accelerate data processing]
    Some images can be quickly identified from the thumbnail page without opening the large individual image view. Users have requested options to increase the size of the thumbnails so that they don't have to go through each individual image to ID. Similarly, while viewing a set of images in Burst mode, users could quickly review the entire burst if the burst set thumbnail previews were larger.

22. **As a user, I want to understand how much progress I've made in verifying images that have already been identified by computer vision.**
    [WI goal met: rewards for data processing]

Currently, the user can see the total number of images there are in the Identify section (see the screenshot below. The number of images remaining to identify is seen in the red oval next to the Identify header). However, there is no quick way to know how much progress a user has made in verifying images in relation to the total number of images available in the project. A user should be able to quickly see how many images are displayed in both sections and how much progress they have made in verifying images.

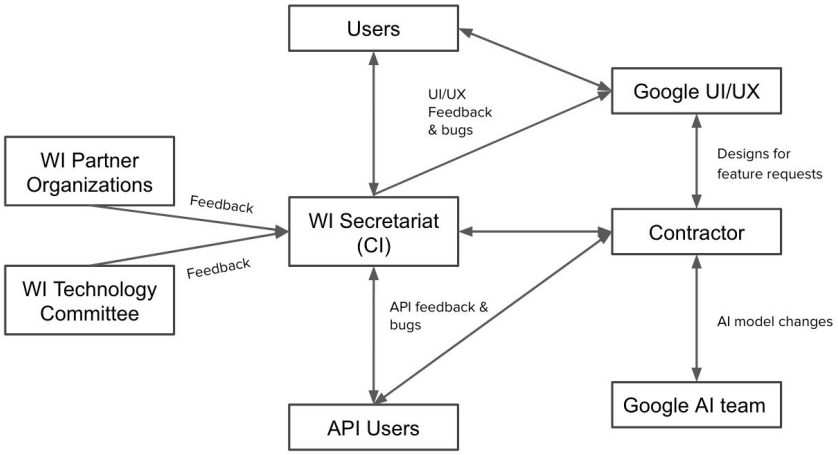


23. **As a new user, I want to know if an organization exists so I can request to join it.**
    [WI goal met: collaboration]
    If a user attempts to create an organization that already exists, they currently receive an error message without any context as to why they cannot successfully create an organization. There is no way for them to know if the organization already exists and how to contact the organization owner. We want to create a mechanism that allows a new user to see whether an organization exists in Wildlife Insights, and if so, a means to contact the organization owner and request access to the organization.

Appendix 2: Wildlife Insights Collaborators

The contractor can expect to interact with the WI Secretariat on a regular basis throughout each phase of development. There are also several collaborators in the Wildlife Insights project that the contractor can expect to interact with occasionally. The table and figure below map out roles and expected workflows:

Collaborator	Role
WI Secretariat (CI)	Main POC for contract and tasks.
Google AI team	Train WI AI model and provide code to developer
Google UI/UX team	Designs new features and leads user testing
WI Partner Organizations	Prepares data for upload; provides input for prioritizing new features; tests new features
Technology Committee	Tests new features
API users	Integrates WI with existing CT data management apps



Appendix 3: Wildlife Insights Platform Technology Stack

Technology Stack

The Wildlife Insights Platform utilizes the following technology stack. References to more detailed appendices with documentation and/or code base are available by request. We will ask you to sign an NDA prior to sharing detailed technical documentation and/or GitHub repositories with our code base.

Google Cloud Platform

- Two Google Cloud Platform projects
- Compute Engine for our marketing website, kubernetes clusters for the main application (prod and dev) and several compute engine VMs for miscellaneous tasks
- Cloud Functions
- SQL Postgres instances for the main transactional databases (both production and staging)
- Object storage
- AI Platform to serve and manage our trained computer vision model

Main Application

- All code is docker based and is split between several private Github repositories
- Front-end uses Node.js with many libraries
- REST API
- GraphQL API
- Python
- Yarn
- Jest
- Airflow for batch upload file and processing and tracking
- Roles and Permissions/Single Sign On
- Jenkins for testing and deployment

Additional details for key parts of the platform are detailed in Appendices 4-8 or linked to external resources. Please contact us for access to Appendices 4-8.

- The marketing site sits in front of the production application. All authentication is handled through the main application. A staging site is also available.
- API swagger documentation
- Main API Service (please contact nflores@conservation.org for access)
    - Roles and Permissions (Appendix 4)
    - Data import (Appendix 5)
    - Data downloads (Appendix 6)
    - Discover Feature (Appendix 7)
    - Wildlife Insights security measures (Appendix 8)