a. Project Abstract: Native Hawaiian Land and Culture: Geo-database for Waimea Valley, Oahu, Hawaii

b. Hiʻipaka, LLC is the lead applicant for this project. The project contractor is Natural Resource Data Solutions Inc. who owns the geo database software that will be used to on the project.

c. The project goal is *to support native Hawaiian individuals' needs for cultural education and work force development by creating a geo referenced dataset for native Hawaiian plant collections and Hawaiian forest restoration areas*. The project seeks to train staff, one of the key project audiences, to catalog and document plant collections and associated data. Waimea valley staff including the project's library intern, supported by the data contractor, will collect and store data in the database and train the native Hawaiian audience to access and utilize the database for conservation, research, and ethnobotanical cultural practices.

d. The two year project will begin October 1, 2018 and conclude September 30, 2020.

e. The native Hawaiian community includes an audience that wants to access and utilize the database for conservation, research, and ethnobotanical cultural preservation. The project seeks to make the information and resources of the botanical collection more accessible to individuals seeking cultural preservation and access to the resulting digital objects.

f. The project has identified three distinct audiences that will benefit from the project in different ways. For the public product a link on the Waimea Valley website to a digital version of the garden map with data icons indicating interesting temporal and geo-located events "fruiting maiʻa " etc. The second audience would be researchers, cultural practitioners or other conservation groups who would receive a log-in to a guest account with NRDS and be able to access the geo located accessions and temporal data including the collection's propagation history and care. The third audience is the garden staff that will actively maintain the database and use the subscription software interface to communicate tasks in order to preserve and propagate the collection.

g. The project goal *to support native Hawaiian individuals' needs for cultural education and work force development by creating a geo referenced dataset for native Hawaiian plant collections and Hawaiian forest restoration areas* will be met by completing the following objectives: 1. Develop a geo referenced data set of native plant collections in the Hawaiian forest restoration areas. 2. Train staff to catalog and document the botanical collection and associated data. 3. Share digital products with additional research and cultural audiences. 4. Evaluate the project impact on all audiences. The outcome for objective one will be a digital product that will serve the Hawaiian community and be maintained and supported by Hiʻipaka LLC into the future. The measure for this objective will be the geo referenced data set of over 1000 native Hawaiian plant accessions in the collection. The outcome for objective two will be the project staff updating and maintaining the database with new information during the project period. The measure for this objective will be metadata records of data collection and database input. The outcome for objective three will be the recruitment of additional community members to use the data set. The measure for objective three will be collected with the completion of objective four the survey of the audiences using the data set product. The outcome from the survey will be the report requested by IMLS in the evaluation section of the request for proposal (appendix 3).

h. The project will implement the IMLS survey questions along with specific questions to the project audiences for IMLS Agency-Level Goal 2: Community.

i. This digital service project is dedicated to the establishment and refinement of digital services including plans for preservation of and access to the resulting digital data set to provide service to audiences from our Native Hawaiian community.

Native Hawaiian Land and Culture: Geo-database for Waimea Valley, Oahu, Hawaii

Native Hawaiian Library Grant

Project duration: 10/1/18-9/30/20

Two Year Budget: $150,000

Digital Services

Digital Services projects feature activities dedicated to the establishment and refinement of digital services and programs related to infrastructure, platforms, and technology, in general. Proposals for digitization projects should include plans for preservation of and access to the resulting digital objects and/or implementing digital library tools to provide services to Native Hawaiian communities.

Project Outcomes:

• support for individuals' needs for education, lifelong learning, workforce development, and digital literacy skills;

• improvement of the quality of and access to library and information services; and

• enhancement of the skills of the current library workforce and leadership.

Who is your organization's audience? Include information about population profile, location, economy, educational levels, languages, culture, and other characteristics that you consider important.

Waimea Valley is located on the north shore of Oahu, the State of Hawaii's seat of government and the highest populated island in the State. The valley is renowned in Hawaiian history as a place of learning. Hi'ipaka, LLC continues these efforts to serve individuals from diverse geographic locations with a focus on sharing the information cultural and botanical resources. We have a large native Hawaiian cultural audience that includes school groups, the research and conservation community, and cultural practitioners. Waimea valley is located in a rural area of Oahu that has a population of mixed socioeconomic backgrounds. The valley strives to be accessible to persons with disabilities and persons with limited functional literacy or information skills. The tactile learning environment can, in some cases, be an ideal fit for individuals having difficulty using a library or museum. Our programs include underserved urban and rural communities; and children from families with incomes below the poverty level.

If establishing and refining digital geo-database to catalog native and endemic plant collections and associated informational content results in increased understanding, interest, and confidence among native Hawaiian participants then we should promote cultural preservation and revitalization through the establishment of digital objects because Hi'ipaka LLC through it's mission statement is dedicated to supporting individuals needs for education, lifelong learning, workforce development, and digital literacy skills; improving the quality of and access to the botanical collection and information services; and enhancement of the skills of the current garden workforce and leadership.

 What specific need will be addressed through your project? Do other projects exist that help to answer their needs? How is what you are proposing different or building upon other work and best answering your audience's needs?

The need for this digital product is to catalog and communicate the valuable information from the restoration activities in Waimea Valley. The unique quality of the database is that it is geo referenced and will be continuously updated by staff after the completion of the grant project. This archival tool is web based and can

be accessed by audiences over the internet. Three levels of user permission will be created to redact certain sensitive data from the lay audience and require sign in for the conservation, research, and cultural audience's use so that sensitive data is protected and the future needs can be communicated to Hi'ipaka, LLC. The botanical and conservation staff will be the third audience served by the digital product created by this project.

Does the applicant demonstrate that it has identified an audience, through a formal or informal assessment of the audience's needs, that the applicant is aware of similar projects completed by other institutions, and that it has developed a project and goals that best answer those needs?

The project goal is to create an accessible and sustainable digital product that multiple audiences will benefit from through introduction, study, use, and curation of the botanical and cultural resources of Waimea Valley.

The conservation, research, and Hawaiian cultural community seek to document and build the data archive in order to catalog the efforts and strategies around the work of native Hawaiian forest restoration and ethnobotanical cultural projects. Our conservation partners include the Koʻolau Mountain Watershed Partnership, Malama Pupukea Waimea, the Outdoor Circle, The Nature Conservancy, the State Department of Land and Natural Resources, the Natural Resource Conservation Service, the Oahu Army Natural Resource Program, the Oahu Invasive Species Committee, and the University of Hawaii.

Similar database projects like University of Hawaii's integrated environmental monitoring project for data acquisition and management deliver capabilities as a core technological infrastructure able to robustly support the research/ management objectives of UH researchers system-wide with an advanced, integrative, data management, storage and processing platform. Building on the conservation by design strategy of the Nature Conservancy we hope to provide data in a geospatial context that can facilitate future decision making as well as create a record of past work, cataloging both success and failure, and displaying this data in a graphical way the is easy for our audience to interpret.

Does the applicant address a specific need and how that need was assessed or determined?

The specific need this project addresses is providing a geo referenced data set of native plant collections in the Hawaiian forest restoration areas. The project seeks to train staff, one of the key project audiences, to catalog and document plant collections and associated collection data. Project staff, including the library intern, and supported by the data contractor, will collect and store data in the database and train the native Hawaiian audience to access and utilize the data set for conservation, research, and ethnobotanical cultural preservation.

What is the current role of the organization in the community and what library services does it provide (e.g., mission, goals, hours and days of operation, staffing, size and content of collection, number of registered patrons, circulation statistics, computer technology, Internet connectivity and access, public programs offered, etc.)?

In December 2007, Hiʻilei Aloha LLC created a sub entity non-profit, Hiʻipaka LLC, to manage Waimea Valley, an ahupuaʻa on the north side of the island of Oʻahu and previously known as Waimea Falls Park. Hiʻipaka LLC holds title to Waimea Valley and manages its daily activities. Today Waimea is a site of cultural preservation with ancient archaeological sites, rich botanical gardens, native and endangered birds, walking tours, school programs, workshops, cultural demonstrations, and 70+ employees. It operates daily from 9:00 a.m. to 5:00 p.m. The audience for the digital product envisioned by this grant proposal will include 1000+ daily visitors to the valley, the garden staff, and conservationists, researchers, and cultural ethnobotanical practitioners from the native Hawaiian community interested in the cultural and environmental natural resources of the valley. The botanical garden boasts a collection of over 5000 accessions including rare and endangered endemic Hawaiian plants, as well as the various unique and often threatened cultivars of traditional Hawaiian planters. Hawaiian artisans use the valley daily for plant material collection, and the valley host semiannual festivals to distribute cultivars of Hawaiian kalo *Colocasia esculenta* to the Hawaiian community to both expand resident populations and satisfy audience demand. The valley hosts researchers from the University of

Hawaii C- Māiki project http://www.pbrc.hawaii.edu/index.php/research/microbiome-research-main-menu that is collecting data on the microbiome community in Waimea Valley.

Does the proposal provide enough information about the role of the organization and the library services it provides? If not, why not? (What is missing?)

As a world renowned botanical garden and repository of endangered Hawaiian species Waimea Valley continues its' tradition as a place of learning and a shelter for knowledge. With over 5000 documented accessions and a dedicated staff of horticulturalists the valley strives to continually maintain and improve the collection. With over 1000 daily visitors the valley is excited to provide opportunities for learning and outreach including interpretive signs, educational programing, and volunteer docent programs.

What is the purpose of the proposed Native Hawaiian grant project as it relates to the specific need that you have identified? What specific audience(s) will the organization serve with this project (e.g., particular age groups, underserved community members, other types of target audience)?

Three target audiences have been identified for the data set project, and they will be introduced to the cataloged information in different ways to best support their learning and utilization of the digital project. The youngest users will be grade school participants in educational programing and the oldest will be senior visitors and docents that make up almost 15% of our annual visitor base. The second and third audience of conservation, research, Hawaiian cultural practitioners, and the garden staff, represent a professional audience that will benefit from a more nuanced and question specific use of the data set.

Does the proposal include information about the purpose of the project and how it relates to an identified need as well as which specific audiences the project will serve with the project? Is the purpose timely and compelling? Why or why not?

Currently visitors to the garden cannot search easily for a plant list or garden location. The digital interface provided on the website as a result of this project will solve this problem. For conservation, research, and Hawaiian cultural practitioners the data set will provide an important record of plant locations, treatments, and availability. The geo referenced nature of the data set will enhance management and allow for offsite query of the current collection health and natural history.

What type of assessment was conducted to identify this need as a priority for the organization? Describe the results of the assessment, including baseline data that can be used to compare with final results to determine the project's success. Why do you consider your approach to be the best solution to meet the needs of the targeted audience?

Survey of the valley management and partners has led to the proposed solution. The garden contains silos of human knowledge not easily accessible or shared. The data set will validate and liberate the information held in the life history of this unique and valuable collection for generations to come. Each of the three target audiences will have a different need or need to know and the geo database products will be tailored to answer key questions without over burdening the graphical interface at each audience level as requested during outreach.

2. Project Design

The project will begin by contracting the data base provider. Natural Resources Data Solution. NRDS has developed a modern user interface for its web and mobile platforms that will allow managers and staff to best utilize and create the data set. The library intern will be hired as project staff to work daily in the gardens and conservation areas to document and enter the accession data into the database. The library intern will partner with staff daily and, with the support of the contractor, will train staff to maintain the database in the future. Managers will use the goal and objective interface of the existing database software to direct work flow and

manage tasks with respect to propagation, planting and record keeping for the collection. The contractor will provide quality assurance and training support including onsite visits to train staff and direct the library intern. With the supervision of the Botanical and Conservation managers the library intern will prioritize tasks including data entry and validation. The contractor will work to publish the data set and create the contracted interfaces for the three project audiences: lay, professional, and staff.

What are the activities required to implement the project? What are the roles and commitments of partnering organizations, if applicable?

In order to complete the project the contractor scope of work will need to be completed. In year one the Contractor will set up the geodatabase for the conservation project and ethnobotanical project areas. The Contractor will work with the Botanical Manager, Conservation Manager and Library Intern to populate the database. The Contractor will trouble shoot issues and act as a quality control evaluator for the database creation. The Contractor will work with the Botanical Manager and Conservation Manager to design and publish three levels of database access from an internet web page portal. An annual subscription and maintenance for database and mobile user accounts will be maintained by Hiʻipaka, LLC. In year two the Contractor will maintain the geodatabase for the conservation project and ethnobotanical project areas. The Contractor will work with the Botanical Manager, Conservation Manager and Library Intern and garden staff to populate the database. The Contractor will trouble shoot issues and act as a quality control evaluator for the data set creation. Annual subscription and maintenance for database account and mobile user accounts. The Contractor will support the maintenance and completion of the data set catalog. The Contractor will train additional staff to maintain and update the database in the future as part of the subscription service.

Did you engage in any preliminary work or planning?

Hiʻipaka has participated in the development trials of the NRDS software and is confident that the product is at a developmental stage that will allow for the completion of the project. The sustainability of the database is supported by multiple conservation agencies and partners in the State of Hawaii and looks poised to become one of the key natural resource management tools of the 21st century.

3. Impact

What are the intended goals and outcomes of the project? Specifically, what are the goals that will guide your project to completion? (Goals are broad statements that should guide your design of programs, choice of projects, and management decisions). What results do you want to see at the end of the project period?

The project goal is to create an accessible and updateable digital product that multiple audiences will benefit from through introduction to, study, use, and curation of the botanical and cultural resources of Waimea Valley.

Objective one is to contract Natural Resource Data Solutions to train and supervise staff in the collection and entry of the data set. Objective two is to hire the library intern as designated full time staff member for the project duration in order to collect and enter the data in the NRDS database. Objective three is to validate the data set and its' utilization through the publication of three user interfaces for diverse audiences including lay patrons, native Hawaiian researchers and cultural practitioners, and garden staff.

The project objectives, when met, will support the project outcome of greater use, accessibility, and learning, based on the availability of the data set and its integration with the NRDS database management software and output designed mobile and web user interfaces.

How will the project specifically benefit the individuals or groups that you serve? For example, what new understandings will participants gain? Do you expect increased interest and/or confidence in particular areas among audience members?

An example of increased understanding for the lay audience would be the ability to plan and research a visit to the botanical garden from the internet resource or be able to revisit the collection online after viewing it in person. An example of a use by the conservation community would be the ability to query the database based on a particular species and learn about its mortality or the out planting spacing used by the conservation program. An example of a use by the research community would be the query of the data set to ascertain the varieties of a genus in the collection to design a research project to be conducted in the valley. An example of the data set use by a native Hawaiian cultural practitioner would be to query the varieties of traditional cultivars in the valley available for propagation. An example of the data set use by the garden staff would be the entry of the planting date and location of new individuals of a certain accession. An example of the use of the data set by the manager would be to query the location of all individuals of an accession and create an out planting task and location for new propagules.

How will you measure progress toward achieving your goals? How do you know you will have reliable information upon which to judge impact or base actions? Are there any expected risks?

When users request a log in for the data base they will be given free access on the condition that they complete a satisfaction survey that includes the IMLS community questions. The only expected risk is that the data set goes unused or is not completed and maintained. The project management will work diligently to publicize the project and inform and train the community on its use. Through the project planning several current partners have expressed interest in accessing the data set when the collection is complete.

4. Communications Plan

What is your communications plan? For example, Who is your audience and how do you plan to reach them? How will you share results, products, models, findings, processes, benefits, and lessons learned from the project openly and effectively?

The data set will be accessible through a clearly marked link on the organization web page for lay audiences. In addition community and professional partners will be invited to attend trainings on second tier access and utilization of the database functions provided by NRDS. The third audience of garden staff will be trained and surveyed on the use of the database.

The communication plan for the project includes several formal trainings as well as community outreach in the form of web site publication and person to person communication. As a renowned project location the valley is continuously approached by potential partners and has several current MOUs in place. The Botanical and Conservation managers will take the lead in project dissemination and community support including working with the Cultural programs manger and Executive team to implement and support community access and utilization of the database.

5. Sustainability

How will you continue to support the project, its results, and/or new models that are created beyond the grant period? For example, will there be ongoing institutional and/or community support of project activities or products? Do you have demonstrated buy-in from potential stakeholders?

Hi'ipaka, LLC. is committed to the long term use and maintenance of the data set and associated database functions. A continuous subscription to the NRDS database functions will be maintained via the visitor revenue from Waimea valley in order to maintain native Hawaiian community access and use of the data set free of charge after the project completion.

What is the extent to which the project's benefits will continue beyond the grant period? Does there appear to be a solid plan for continued support for project activities and products beyond the grant period? Is there demonstrated buy-in from potential stakeholders? Why or why not?

The project will provide new an unprecedented remote access to the updated and historic data with respect to the garden's botanical collection, native forest restoration activity, and ethnobotanical community resources.

What are your plans for sustaining any digitized collections, software, and supporting documentation, information systems, and other technology tools?

Through the project period staff and managers will be trained in the use of the data base as both a data set creation tool and a task management tool. The later function will lead to the future maintenance and updating of the data set as all maintenance activity will be logged directly into the database through the NRDS software interface.

6. Schedule of Completion

Attached.

Schedule of Completion

Year One 2018-2019

Task	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Contract with NRDS	■											
Hire Library Intern	■											
Train Staff on Data Entry		■	■									
Managers Create Plan to Collect Data on Priority Hawaiian Accessions	■	■										
Staff Collect Data on Accessions Through the Use of NRDS Management Software		■	■	■	■	■	■	■	■	■	■	■
Train Community Members on Data Set Use and Database Access								■	■	■	■	
Publish Website Lay Version of Data Set on waimeavalley.net									■			
Contractor Conducts Quality Control and Review Data Set						■				■		

Year Two 2019-2020

Task	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Staff Collect Data on Accessions Through the Use of NRDS Management Software	■	■	■	■	■	■	■	■	■	■	■	■
Library Intern acts as onsite quality control supports staff and troubleshoots Issues with Contractor,	■	■	■	■	■	■	■	■	■	■	■	
Train Community Members on Data Set Use and Database Access	■	■										
Update Website Lay Version of Data Set on waimeavalley.net on a quarterly basis with new data catalog			■				■				■	
Contractor Conducts Quality Control and Reviews Data Set	■				■				■			■
Managers complete audience survey and review of project outcomes.										■	■	

DIGITAL PRODUCT FORM
Part I: Intellectual Property Rights and Permissions

A.1 The digital product will be a data set owned by Hi 'ipaka LLC. Users of the data set will not require additional permissions or licensing once the data set is accessed.

A.2 Users of the dataset can request free temporary access to a subscription based data portal that includes a geo referenced interface. A base level of the data set will be available to access through a link on the organizational website. The reason for the two tiers of access is that some information will include the location of the living collection and plants have been stolen or damaged in the past.

A.3 In order to protect Hawaiian cultural resources including native plant collections and threatened and endangered species a relationship with Hi'ipaka LLC will be needed to allow verification of research intent and tracking of the individuals accessing sensitive data. Once the relationship is established Hi'ipaka reserves the right to terminate access to the data set at any time. There will be no cost to use the data set.

Part II: Projects Creating or Collecting Digital Content, Resources, or Assets
A. Creating or Collecting New Digital Content, Resources, or Assets
A.1 The NRDS database is geo referenced and designed to collect life history data on the collection. This information can include plant type, accession, propagule, location, health, treatment, fruiting and seeding schedule, and mortality. The project has an objective of cataloging over one thousand accessions during the project period. Each accession may have multiple reference files associated with its life history and care.

A.2 The NRDS database runs on a web browser or a mobile platform. The data will be entered using multiple tablet computers in the field as well as a desktop computer in the office. The contractor Natural Resources Data Solutions, Inc is the owner of the software and will license the use of the database and mobile accounts to Hi'ipaka for the duration of the project and after the project end date.

A.3 .CSV, .SHP, KML

B. Workflow and Asset Maintenance/Preservation
B.1 Natural Resources Data Solutions Inc. will act as quality control manager as part of their contract for the data set creation. The Library Intern and other participating staff will be trained by the contractor and kept in regular communication.

B.2 Hi'ipaka LLC will maintain a subscription to NRDS database and mobile application to update and preserve access to the data set and associated features enabled by the software.

C. Metadata

C.1 All spatial data will be created with the ability to provide FGDC component metadata https://www.fgdc.gov/metadata/geospatial-metadata-standards. All relevant taxonomy will be cross referenced with ITIS https://www.itis.gov/ and will all records will be linked ITIS numbers

C.2 Hiʻipaka will contract with the Contractor for maintenance metadata in creation of the database after the grant project ends.

C.3 The NRDS platform API will library records accessible to other platforms. We can make data publicly available or accessible only with proper authentication.

D. Access and Use
D.1 Hi'ipaka will provide access to the lay product through a link on the company web page www.waimeavalley.net Hi'ipaka will also work to share the database function and recruit users from the larger native Hawaiian community including researchers, cultural practitioners, and conservation groups. Hi'ipaka will conduct ongoing training and support for staff tasked with using and updating the data set during the project and after the project period ends.

D.2 Comapany Website:
www.waimeavalley.net

Part IV: Projects Creating Datasets
A.1 The geo referenced data set will include plant type, accession, propagule, location, health, treatment, fruiting and seeding schedule, and mortality. The project has an objective of cataloging over one thousand accessions during the project period. Each accession may have multiple reference files associated with its life history and care. Staff and researchers will use the data to access and care for the collection. Cultural practitioners can use the data to request propagules and collect plant material.

A.2 No.

A.3 Users of the dataset can request free temporary access to a subscription based data portal that includes a geo referenced interface. A base level of the data set will be available to access through a link on the organizational website. The reason for the two tiers of access is that some information will include the location of the living collection and plants have been stolen or damaged in the past.

A.4 No.

A.5 The data is specific and technical and will be collected and supervised by trained staff using the NRDS data input fields that guide data input.

A.6 Documentation to use the resources can be placed directly in the garden web site or on the NRDS help and documentation site. Help.nrds.io

A.7 Hi'ipaka LLC will maintain a subscription to NRDS database and mobile application to update and preserve access to the data set and associated features enabled by the software.

All data is accessible and downloadable as excel and csv files. Spatial data is downloadable as KML or shapefile

A.8 Name of repository: app.nrds.io
URL: app.nrds.io

A.9 The data management plan will be reviewed annually during the contract renewal. The implementation of the data set creation and use will be monitored by the Botanical Manager and the Conservation Manager.