NORTH COAST RESOURCE PARTNERSHIP

EXHIBIT A
PROPOSAL COVER PAGE

Proposal Type

☑ Concept Proposal for Demonstration Projects and Processes

Organization Name (Lead Applicant)

Humbots Data & Analysis

Organization Type

☐ Federally recognized Indian Tribe

☐ California State Indian Tribe

☐ Public agency

☐ Local or state agency/special district

☐ Resource Conservation District

☐ Non-profit organization

☐ Public utility

☑ Other: Private business (L.L.C)

Contact Name/Title

Name: Joe Snipes

Title: C.F.O.

Email: Joe.snipes@humbotsda.com

Phone Number (include area code): 707.382.8702

Organization Address (City, County, State, Zip Code):

PO Box 92 Hydesville CA. 95547

Authorized Representative (if different from the contact name)

Name: _____

Title: _____

Email: _____

Phone Number (include area code): _____

Certification of Authority

By signing below, the person executing the certificate on behalf of the proposer affirmatively represents that s/he has the requisite legal authority to do so on behalf of the proposer. Both the person executing this proposal on behalf of the proposer and proposer understand that the NCRP is relying on this representation in receiving and considering this proposal. The person signing below hereby acknowledges that s/he has read the entire Request for Proposals document and has complied with all requirements listed therein.

Official Authorized to Sign for Proposal

_____
Signature

3/13/2020
Date

1. Key personnel and their qualifications
   a. **Joe Snipes**
      Joe Snipes is a devoted business owner to ForestScapes and Humbots Data & Analysis. He has a degree in Forestry and Natural Resources from College of the Redwoods. He has work experience on fuels reduction and fire suppression with the National Park Service and the U.S. Forest Service. His experience is in sales/customer relations and in safety training and implementation. He is a licensed FAA 107 certified pilot, and has training or experience in many fields of forestry management.
   b. **Danny Kelley**
      Danny Kelley is a passionate business coach and leader. Owns a public benefit corporation with a specific purpose of using its business to inspire individual, social, and environmental change that improves the human condition. His experience includes a 20-year career in software development using Agile methodologies. Danny holds a BA in Cross-Cultural Studies and an AA in Business. He holds several certifications in business and executive coaching and is affiliated with the International Coaching Federation (ICF).
   c. **James Lamping**
      James is a graduate student at Humboldt State University with a B.S. in Forestry and a minor in geospatial analysis. He is interested in the implementation of remote sensing applications in forestry. This past field season, James worked at Teakettle Experimental Forest, assisting in tree coring, regeneration surveys, canopy photos, stem mapping, and very high-resolution imagery collected using unmanned aerial systems (UAS) platforms.
   d. **Omar Padilla**
      Omar has been working with Humbots since March 2019, shortly after relocating from New York City. Largely self-taught, he is driven by a love of learning and exploring new technologies. Born in Puerto Rico and raised on Manhattan's Upper West Side, Omar began his career at Intellispace, an Internet service provider located near Times Square. From there, he moved to New York-Presbyterian Hospital in Upper Manhattan where he worked as Information Systems Manager. Three years later, he literally crossed the street to work for Columbia University Medical Center as Senior Systems Manager for Columbia Doctors. In his spare time, his constant inquiry and research on the tech front led him to develop an interest in UAV technology.
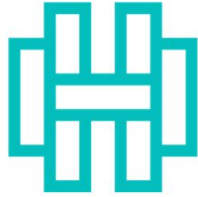
Omar has been working with drones for three years and is an FAA certified remote pilot. He is responsible for the electronic & hardware platform build and support for our new lidar development effort. Omar is currently an IT Security Analyst at County of Humboldt Information Technology.

e. **Aaron Zuspan**

Aaron Zuspan graduated *magna cum laude* from Humboldt State University with a degree in Forestry Restoration and Geospatial Analysis, and is currently pursuing a master's degree in Geographic Information Systems through the University of Central Arkansas. With a strong background in geospatial science, data analysis, and computer programming, he is passionate about using those skills to help manage and protect natural resources.

f. **Jeffrey Laikam, PE**

Jeffrey Laikam is a California registered civil engineer with a Bachelor of Science in Environmental Resource Engineering. His experience includes a 20 year career performing topographic surveying, land development, utility design, stormwater modeling, and infrastructure design. He has supported projects ranging from development of improvement plans for public jurisdictions, site restorations ranging from cannabis notice of violations to final site restoration for a decommissioned power plant, large subdivision design including low impact development stormwater design, CEQA initial studies, sewer and water system model and roadway and mass grading design.

g. **Cassie Snipes**

Cassie is Joe's spouse. She has a degree in Art and has 5+ years of experience in bookkeeping, A/P, and other various clerical work. She serves as HumBots bookkeeper and maintains contact with the it's CPA.

2. Proposed subcontractors
   a. N/A

3. Hourly rates - $80 per hour for all operations involving drone piloting and processing. For a visual observer and bookkeeper the rate is $40 per hour.

4. References

   a. Harold Zald - professor at HSU Forestry and GIS departments - 707.826.5484, hsz16@humboldt.edu

![HUMBOTS DA logo - YOU SEE THE FOREST - WE SEE THE TREES]

    b. Jim Graham - professor at HSU Environmental Science and GIS departments - 707.826.3823, james.graham@humboldt.edu

    c. Jim Baskin - retired Coastal Commission, owner of Lems Ridge LLC a private forestry business in Del Norte County - 707.601.8392, jim.baskin.54@gmail.com

    d. Mickey Jarvi - professor of Forestry and Geomatics at Michigan Tech - 906.369.4221

    e. Tim Baker - Professor of Forestry at College of the Redwoods - Tim-Baker@redwoods.edu

    f. Greg Foster - Executive Director for Redwood Economic Development Commision - 707.445.9651, gregg@rredc.com

5. lists /hyperlinks to examples of relevant work that support the proposal

    a. [Remote Sensing of **Wildfire Using** a Small Unmanned Aerial System: **Post**-Fire Mapping, Vegetation Recovery and Damage Analysis in Grand Bay, Mississipp](#)

    b. [**Drone** applications for supporting disaster management](#)

NCRP DEMONSTRATION PROJECT AND PROCESSES CONCEPT PROPOSAL BUDGET AND SCHEDULE

Using drones for post fire recovery operations

Major Tasks	Task Description	NCRP Task Budget	Funding Match *	Total Task Budget	Scaled NCRP Budget	Start Date	End Date
Project Administration	In cooperation with the County of Humboldt sign a sub-grantee agreement for work to be completed on this project. Develop invoices with support documentation.	$0.00	$0.00	$0.00	$0.00		
Project Reporting	Data collection, performance measures, and project reporting of outcomes/lessons learned	$0.00	$0.00	$0.00	$0.00		
Non Labor - Cost of goods sold (perdium, gas, bar oil, mix, propane,)	[ADD ROWS AS NEEDED]	$0.00	$0.00	$0.00	$0.00		
Labor		$0.00	$0.00	$0.00	$0.00		
Fixed Expenses		$0.00	$0.00	$0.00	$0.00		
		$0.00	$0.00	$0.00	$0.00		
Project Closeout		$0.00	$0.00	$0.00	$0.00		
Total NCRP 2020 Demonstration Project Request		**$0.00**	**$0.00**	**$0.00**	**$25,000.00**		

* List the sources and status of matching funds: [PLEASE LIST]

** Is Requested Budget scalable? If yes, indicate scaled totals; if no leave as $0.

Project scalability information for the reviewers (optional):

Post Fire Emergency Response

Purpose

The purpose of this proposal for grant funding is to obtain monies to assist with the post wildfire documentation of conditions and provide critical data to identify the logistical requirements for safe hazard mitigation in the fire effect area. Humbots Data and Analysis will utilize unmanned aerial vehicles (UAV) to map the hazards in affected areas and aid operational teams in providing targeted response to critical post wildfire dangers.

1. Project Description

The destruction of wildfires comes in many forms. The ability of a community to recover from a wildfire is largely dependent on post fire planning and operations. UAV technology and structure from motion procession are a crucial component to set up logistical concerns such as safe staging areas, fire effect and to identify hazards such hazard trees, powerlines, and potential erosion issues.

Our company, Humbots Data & Analysis will provide before and after photogrammetry with unmanned aerial vehicles (UAV) on a post wildland fire to establish a map of logistical concerns and hazards. We would like to provide monitoring on a monthly basis to identify changes until the management team has left the operation.

We have been in contact with Six Rivers National Forest, Cal Fire, and Redwood National park to be used on one of their 2020 wildland fires.

We plan to fly automated flight paths, in which we can usually fly 10-20 acres per mission but the area we can cover can be scaled up depending on available batteries and lighting conditions. The processing time usually is for every one hour of image collection would need about two working days of processing.

Phase I: Project Prerequisites
1. KMZ or KML file of the affected area
2. Scope of survey - document hazards (UAV and personnel, vegetative recovery, erosion etc.)
3. Operational restrictions from the Fire Crew, FAA or jurisdiction
4.

Phase II: Project Preparation Steps (utilizing data files)
1. Identify take off and landing zones
2. Identify potential ground control points (with field verification if necessary)
3. Verify line of sight restrictions
4. Prepare flight plan
5. Coordinate the timing of the survey.

Phase III: Project survey
1. Survey steps with safety protocol

Phase IV: Data Processing and Map Generation
1. Timing and formats

Required Personnel:
1. Licensed pilot
2. Visual Observer

The following outputs will be delivered to project management:

      i.   High density SfM Point Clouds of all plots
     ii.   RGB Orthophoto of all plots
    iii.   Ground control using RTK GPS
    iv.   Accuracy report associated to all rendered models
     v.   Raw imagery collected at the site
    vi.   Raw GPS data collected at each site
   vii.   multispectral imagery

The expected benefits from this operation will be:

1. Aerial imagery that can show wildfire damage and vegetative recovery.
2. Reduced costs compared to traditional methods.
3. Shorter time span to collect and deliver data.
4. To identify stand dynamics - spacing, canopy density, brush component (post treatment only)
5. Monthly monitoring will allow identification of areas which are subject to erosion and sediment movement and provide an opportunity to stabilize these areas prior to major damage to the recovering ecoculture.

How this process supports and achieves the objectives of the NCRP RFFC objectives

This project will support the objectives of the NCRP RFFC by providing a dedicated business that has goals of achieving environmental and social justice through data collection and processing. We are passionate about providing data to increase forest resiliency, post fire management and general natural resource monitoring and data collection. It will help in achieving their objectives by providing high quality, accurate data that will lay the framework for natural resource benefits and community recovery.

2. Specific project goals/objectives

1. To establish baseline fire damage and to follow up weekly to detect changes in: vegetation, hazards, land movement (landslides, erosion), NDVI indices.

3. Describe how the project or process addresses the NCRP Goals and the intent of the NCRP regional forest and fire capacity program block grant

1. Respect local autonomy and local knowledge in Plan and project development and implementation
   a. Humbots is a close partner with HSU's UAV and GIS programs. We strive to acknowledge, test and implement the newest and best practices available. We remain close to staff and students to keep updated on current program needs and future endeavours. We are also part of the airport advisory committees uav ad hoc committee that is committed to expanding and implementing a uav workforce in Humboldt County. We strive to respect, incorporate and include indigenous/local knowledge of our lands and are always willing to listen to others' input.
2. Ensure that economically disadvantaged communities are supported and that project implementation enhances the economic vitality of disadvantaged communities by improving built and natural infrastructure systems and promoting adequate housing
   a. We are structured as a public benefit LLC which means that we donate a percent of our profit to environmental and social justice.
3. Conserve and improve the economic benefits of North Coast Region working landscapes and natural areas
   a. Our data will lower budgets of data collection while providing land managers with better data to make more informed decisions.
4. Conserve, enhance, and restore watersheds and aquatic ecosystems, including functions, habitats, and elements that support biological diversity. --
   a. Our surveys will aid the recovery of fire affected watersheds and provide support for vegetative recovery and restabilization of damaged ecosystems. We are structured as a public benefit LLC which means that we donate a percent of our profit to environmental and social justice.
5. Enhance salmonid populations by conserving, enhancing, and restoring required habitats and watershed processes
   a. Our data will allow managers to obtain accurate digital elevation models that will allow managers to implement certain strategies to enhance salmonid populations. These strategies could include response to newly developing hazards (erosion) or riparian habitat restoration.
6. Ensure water supply reliability and quality for municipal, domestic, agricultural, Tribal, and recreational uses while minimizing impacts to sensitive resource.
   a. Mitigation of hazards and assistance of watershed vegetative recovery will contribute to the recovery of water quality within water resources which may be utilized by municipal, domestic, agricultural, tribal and recreational uses
7. Improve drinking water quality and water related infrastructure to protect public health, with a focus on economically disadvantaged communities
   a. While our proposal does not directly improve drinking water quality, it will assist in the recovery of watershed water resources by identification of hazards and localized erosion and provide opportunities to stabilize these areas.

3

8. Address climate change effects, impacts, vulnerabilities, including droughts, fires, floods, and sea level rise. Develop adaptation strategies for local and regional sectors to improve air and water quality and promote public health.
   a. We will be able to provide data that can account for carbon sequestration on an annual basis following a fuels reduction project that can be used by agencies to report based on CCI requirements.

4. Describe how this project is scalable, replicable, measurable, innovative and results in outcomes that will increase the scope and scale of multibenefit forest management in the North Coast.

a. Scalability - With over 30 million acres of forest land in California, the amount of proposed fuels reduction projects and California's carbon accounting requirements, this process can be scalable as long as people continue to manage their forests. We are located near Humboldt State University that has a top notch Forestry and geospatial program that can aid our growing workforce when we are ready to scale up. We have financial ties through family and friends as well as the local lending agency, Redwood Region Economic Development Commission that can help with loans and our cash flow needs.
b. Replicable - Our plan may be adjusted and utilized on a variety of natural disasters including flood recovery, earthquake recovery, and wind storm recovery. Our survey could be used to identify damage to housing, utiliities, public infrastructure such as roadways, slides. this can be easily replicated on any natural disaster and has been well documented to be a reliable and helpful service
c. Measurable - we can monitor changes on a monthly basis to detect and measure changes such as vegetation, hazards, land movement (landslides, erosion), NDVI indices.
d. Innovative - robotic technology is improving daily. Compared to traditional methods this is much faster, easier and much less dangerous.

5. Describe the need for the project and how the project addresses forest health and climate change/extreme event resiliency.

a. The need for fast, accurate and recurring data collection is one of the main foundations to any project. The documentation of a given site can lead to the i more streamline planning and project implementation. This is needed to help reduce time spent rehabbing a wildland fire and to properly document all the steps along the way. With the uncertainty of winter weather conditions, the ability of an incident command team to prepare for winter erosion and landslides is extremely critical. It can directly benefit many forest communities, for example - preventing sediment from going into streams and by keeping roads clear and open.

6. Describe the location and size of the project and the communities served by this project.

a. TBD - I have tried to reach out to USFS and Cal Fire but I have not had a solid response.

7. List and describe the partnerships involved in the project and local and/or political support.

a. College of the Redwoods - Professor Tim Baker, HSU, RREDC, SBDC (Small Business Development Center), Edge Caliber - *See Statement of Qualifications for contact information.*

8. List the estimated quantifiable, measurable, benefits expected to result from the proposed project

a. Vegetation health (NDVI)
b. number of hazards
c. Land movement (cubic feet)
d. Sediment prevented from entering stream (cubic feet)

9. List any scientific studies, plans, designs or reports completed for the project of process.

a. Remote Sensing of **Wildfire Using** a Small Unmanned Aerial System: **Post**-Fire Mapping, Vegetation Recovery and Damage Analysis in Grand Bay, Mississipp
b. **Drone** applications for supporting disaster management

10. Describe the approach to data collection, performance measures, and project reporting of outcomes/lessons learned.

a. Data will be collected by a UAV that will fly in automated flight paths around the proposed unit(s). We typically fly it in a gridded pattern to allow for a controllable amount of overlap for each image. We will use Agisoft software and will have the following outputs:
b. Performance measures - We always trach each of the following performance measures
     i. Prepare flight plan
     ii. Prepare equipment
     iii. Schedule inspection
     iv. Conduct inspection had to fly it twice as the first time it did not do the correct flight path.
     v. Conduct post inspection
     vi. Data processing & delivery of service

c. Project reporting of outcomes/lessons learned -
     i. We can cater to the needs of the NCRP. We can either meet in person, do a virtual meeting or have a standard report of our outcomes/lessons learned.