



**TO:** Governance Committee (GC)  
**FROM:** Executive Director's Office (EDO)  
**SUBJECT:** Whooping Crane Stopover Site Research Sole-Source Justification  
**DATE:** November 20, 2012

### Recommendation

The Technical Advisory Committee (TAC) recommends the GC approve a sole-source contract with the U.S. Geological Survey (USGS) to conduct the whooping crane stopover site evaluation research project to collect data at stopover sites used by radio-marked whooping cranes. If approved, FY 2013 funding for this research (**\$110,297**) would be covered by Program line item WC-6 (Whooping Crane Stopover Site Evaluation Project). As proposed, the project would be a three-year study (2013-2015) with a fourth year (2016) for data analysis and reporting. If approved, the Program would enter into a four-year contract (2013-2016) with the USGS with a total Program cost not to exceed **\$307,513**. Annual funding would be reviewed by the TAC, Finance Committee (FC), and GC and annual funding approval would be at the discretion of the GC. The scope of work and associated budget for the stopover site project is attached to this memorandum as **Exhibit A**.

On October 17, 2012 the TAC approved a motion in support of the stopover project with the study area defined by one days' flight distance (600 miles) of the Platte River as well as the proposed 2013 budget (including costs of two computers and associated data plans) for the project with the understanding this would be a three-year project with an additional year for data analysis and reporting and that out-year budgets would be approved by the GC annually.

### Background

The whooping crane telemetry project began in 2009 and the Program entered into a multi-year Agreement with the Whooping Crane Tracking Partnership team in 2011 that will continue through the end of the Program's First Increment (2019). The telemetry project is led by five core partners including the Program, USGS, Crane Trust, USFWS, and Canadian Wildlife Service and data collection is scheduled to continue through 2016. In spring 2012, the Crane Trust and Program staff collaborated on a pilot study to evaluate stopover sites used by radio-marked whooping cranes in the state of Nebraska. On August 21, 2012, the Crane Trust presented preliminary results to the TAC and expressed interest in continuing this research with an expanded scope. The TAC recommended the EDO, Trust, and USGS work together to develop a proposal for evaluating WC stopover sites within one-day's flight distance as well as a ½-day's flight distance of the central Platte River. On September 26, 2012, the TAC considered a budget for both study extents and asked the USGS and Trust to reconsider the proposed project scale and budget to determine if: 1) the Program could fund the project on a smaller scale (i.e., Nebraska); 2) if some of the actual costs of the project could be covered by USGS, Trust, or another entity; and 3) if the Trust and USGS could re-submit the proposal and budgets at the October TAC meeting.

On October 17, 2012, the TAC considered budget estimates to conduct the study within Nebraska only as well as within a one-day's flight distance of the central Platte River. The TAC recommended the GC support a sole-source contract for whooping crane stopover site evaluation project with the study area defined by a one-day's flight distance (600 miles) of the Platte River as well as the proposed 2013 project budget (including costs of two computers and data plans) with the understanding this would be a three-year project and that out-year budgets would be approved by the GC annually.

The TAC believes that the Stopover Site Evaluation project will greatly increase the amount of data collected at roost sites used by whooping cranes and will be incredibly valuable for informing habitat



management actions along the central Platte River and refining the Program's Habitat Suitability Criteria. The proposed research is a one-time opportunity to collect this type of data on whooping cranes and truly is a "sole-source" project because only the Whooping Crane Tracking Partnership team has access to the telemetry data and can identify stopover sites on a near-real time basis. The USGS is a fully-approved partner in the telemetry project, and their role as the Telemetry Project lead makes them an obvious conduit for Program funds for the Stopover Site Evaluation project. Though the sole-source contract would be with the USGS, the USGS and Crane Trust would conduct the study jointly. Both are members of the telemetry project Core Partnership, both have experience utilizing whooping crane telemetry data and evaluating use site habitat characteristics, and both are willing to abide by PRRIP contract requirements to conduct the study as a PRRIP contractor.

### **Budget Implications**

As per the proposed project budget from the USGS and Crane Trust, the first year contract total for the stopover project is \$110,297. This amount is included in line item WC-6 of the draft FY2013 PRRIP budget, to be presented for review and approval by the GC at the December 2012 meeting in Denver. If approved, this amount would cover project activities in calendar year 2013. Annual budgets for the project in out years would be included as part of the annual PRRIP budget development, review, and approval process. If fully funded for the life of the project, total PRRIP funding from 2013-2016 would be **\$307,513**.



## **PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM**

### **EXHIBIT A**

#### **Whooping Crane Stopover Site Evaluation Project Scope of Work & Budget**

## **Why stop here? Using telemetry-marked whooping cranes to understand habitat selection during migration**

Aaron Pearse—Research Wildlife Biologist, U.S. Geological Survey

Mary Harner—Director of Science, The Crane Trust

October 17, 2012

### **BACKGROUND**

Conservation organizations have spent millions of dollars acquiring and maintaining habitat for whooping cranes in their migration corridor, especially along the Platte River in central Nebraska. Scientists and resource managers have applied the best available science to define habitat requirements for whooping cranes during migration, but this information is limited due to the rarity of whooping cranes, their often-undetected occurrences, and the low resolution of spatial data reported in personal sightings. However, new information gained from the Whooping Crane Tracking Partnership (WCTP) overcomes many of the limitations of direct sightings and offers an unprecedented opportunity to learn about habitats selected by whooping cranes. This detailed information will help the Program and other resource managers better define minimum habitat criteria and refine restoration targets to more effectively manage and protect whooping crane habitat along the Platte River and beyond.

The WCTP is an innovative, collaborative project among the Canadian Wildlife Service, Crane Trust, Platte River Recovery Implementation Program (Program), U.S. Fish and Wildlife Service, and U.S. Geological Survey to follow movements of whooping cranes with GPS satellite tracking technology to advance knowledge of whooping crane breeding, wintering, and migration ecology. To date, partners have followed movements of 45 whooping cranes (nearly 20% of the wild population), recording up to four locations of individuals per day, thus greatly expanding our knowledge of sites used by whooping cranes during migration through Nebraska.

Over the first four years of the tracking project, the WCTP discovered that whooping cranes stopped at sites outside of the Platte River Valley more than previously documented by public observations, as well as used sites that did not conform to predictions. To better describe stopover locations (sites visited  $\geq 1$  night), researchers from the Crane Trust and the Program conducted a pilot study following spring migration in 2012. Objectives of the pilot study were to develop field protocols; determine whether landowners would permit access to private lands to conduct site evaluations; characterize stopover sites; and assess landowner awareness of past whooping crane use.

### **PRELIMINARY RESULTS OF PILOT STUDY**

Most landowners responded positively to researchers accessing lands (12 of 13 contacted permitted property access). In most cases (9 of 13), people were unaware that whooping cranes had stopped on their property. Of the four that were aware, two were sightings on USFWS lands; neither private landowner reported the crane sightings in 2012. Conversations with landowners revealed that marked birds traveled in flocks of 2, 3, 12, and 14 birds, which

provides details unavailable with the telemetry data alone. Six landowners observed whooping cranes in previous years, and most landowners had a positive perception of whooping crane use of their lands.

Site evaluations were conducted opportunistically, an average of 53 days after a stopover, with one site visited 2 days after birds departed. Because many measurements did not reflect conditions whooping cranes actually encountered, results must be interpreted with caution. The roosts used by birds were wetland (8 sites), riverine (4 sites), and upland (1 site) habitats. Riverine roosts had channel widths averaging 170 m (range 40-460 m); view widths averaging 154 m (range 38-480 m); nearest disturbances at 438 m (range 175-676 m); and nearest obstructions at 99 m (range 17-340 m). Wetland roosts had an average area of 3.3 ha (range 0.06-22.4 ha), nearest disturbances at 565 m (range 250-900 m) and nearest obstructions at 267 m (range 22-1100 m). The non-wetland roost was on a hilltop with distance to nearest obstruction of 480 m. The site visited at 2 days after birds departed revealed that birds had occupied a wet depression under a center pivot arm, a somewhat unexpected roost site given the presence of an overhead obstruction.

An overall conclusion of the pilot study and subsequent discussions was that the most important information about sites (from a whooping crane use perspective) is unavailable if sites are not visited soon after the birds depart. Site visits also highlighted the potential importance of wetlands embedded in agricultural fields for whooping cranes and the need for refinement of the scale of habitat classification—i.e., a cornfield may not be just a cornfield, and that habitat classifications need to consider features at smaller scales, such as wetland features, that may provide resources to whooping cranes.

## **OBJECTIVES AND RATIONALE**

Knowing what habitats whooping cranes select, and potential resources available from those habitats, is essential for management of the species. We seek to visit and characterize stopover sites used by whooping cranes within a day's flight from the Platte River (approx. 600 mi) to document surrounding habitat characteristics and land management practices, immediately after birds have departed, to better define minimum habitat criteria required by the species.

There is a small window of time available to conduct this research, as the telemetry project is approximately at the halfway point, and some transmitters will cease functioning relatively soon. We need to act now to maximize what we can learn from the existing transmitters. The Program and other conservation organizations have the potential to positively affect conservation and management of habitat for whooping cranes, and these efforts will be greatly informed by understanding habitat characteristics of stopover sites throughout the Great Plains.

The proposed study area (600 mi buffer surrounding the Platte River) is biologically rooted as the potential area a bird could cover over one day and select Platte River sites among other stopovers. This study area represents an economy of scale, because many project costs are fixed (personnel), and the technicians' efforts can be expanded spatially with relatively small expenditures of additional travel costs compared to shorter distances (i.e., ½ day's flight distance of 300 miles).

We strongly advocate visiting stopover locations immediately after birds have left the site, rather than limiting characterizations to remotely sensed information and ground-based measurements taken weeks or months after use. If sites are not visited immediately, key measurements associated with characterizing the physical, biological, and chemical properties of the site cannot be measured reliably, and therefore cannot be compared directly to measurements on the Platte River that are taken soon after birds occupied the site. The primary costs of the study are personnel and travel. Visiting sites long after cranes leave will reduce these costs only modestly but will significantly degrade quality of data gathered. Furthermore, in many cases, taking additional ground-based measurements will involve a small time commitment and will add substantially to our understanding of site attributes and reliability of information gained from landowners' recollections of recent crane use and land management.

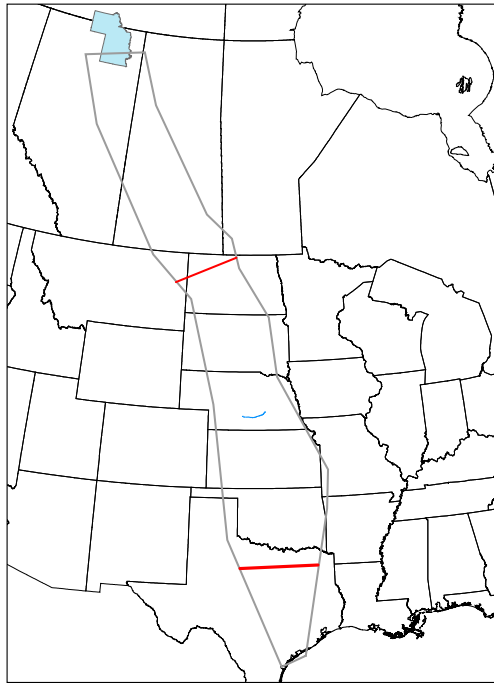
## **PLANNED ACTIVITIES**

### **Schedule and extent of proposed work**

The study will span spring (Mar-May) and autumn (Sep-Nov) migrations over three years (2013, 2014, 2015) and include analysis and product preparation in 2016. The proposed fieldwork time frame represents years in which a large sample of tagged cranes will be available. Preliminary data suggest cranes can migrate up to 1000 km (620 mi) per day. We suggest that stopover sites within approximately a day's flight north and south of the Platte River should be investigated because: 1) sites are close enough to the Platte River to be potential stopover sites immediately before or after a bird used the Platte River, 2) sites have the potential to be used instead of the Platte River, and 3) sites within this region may have more in common with the Platte River than sites at greater distances. Using this approximate migration distance, sites generally within the states of North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma will be included as candidate sites to visit and conduct on-site characterizations (see Figure 1).

### **Site visits**

Any site used by cranes for at least 1 night will be defined as a stopover site. Stopover sites represent all areas used by the crane, as determined by GPS data, and include roost sites (nocturnal use sites), and sites used during the daytime. We will collect different types of data for each of the location types (nocturnal and daytime) and information within the stopover site in general (1-mile buffer surrounding all locations used). In general, data will be gathered to assess the following: 1) physical characteristics; 2) hydrological characteristics; 3) land use and land cover; 4) potential food resources available; 5) thermal cover; 6) natural and anthropomorphic disturbances or threats; and 6) landowner knowledge, awareness, and sentiment (see Table 1).



**Figure 1.** General migration corridor of GPS-marked whooping cranes, 2009-2012 (gray outline). Red lines represent approximately 1,000 km buffer around the central Platte River Valley (blue), which represent the majority of stopover sites that whooping cranes could conceivably use before and after stopping at the Platte River or sites cranes might use instead of stopping at the Platte River. We propose to visit stopover sites within this area to determine characteristics of sites for comparison with those used on Platte River.

We will focus efforts on nocturnal sites because these are likely the most important to birds in regards to their safety and security as cranes are likely most vulnerable after dark. Our data collection will vary depending on the type of nocturnal site chosen by the crane (i.e., riverine, wetland, dryland), although a common set of characteristics will be collected to compare among types and with roost sites used along the Platte River (see Table 1). We also will collect a suite of data at daytime use sites. Cranes may be feeding at these times; therefore, data collection will include identification of potential food items as well as physical characteristics likely related to safety and cover.

**Table 1.** Examples of measurements that will be collected at different types of stopover locations.

<b>Riverine</b>	<b>Non-riverine wetland</b>	<b>Non-wetland</b>	<b>All sites</b>
Channel width	Water area	Habitat type	Disturbances
View width	Max depth	Field size	Obstructions
Wetted width	Wetted width	Vegetation height	Endangerments
Use-site depth	Use-site depth	Nearest water area	Land use
Suitable depth (%)	Wetland length	Other habitats	Land rotation
Bank-line habitat	Bank slope	Dominant vegetation	Awareness past use
Channel depth > 1 m	Surrounding habitat		
Turbidity	Turbidity		
Sediment type	Soil type		
Flow (USGS gage)	Aquatic veg cover		

As some of the site characteristics are time sensitive (for example, water conditions), we propose to send field crews to sites within 7 days after cranes are known to have left the area. We

anticipate that field crews will be unable to visit all sites used by cranes within this 7-day sampling window during peak migration. Therefore, we will set up a prioritization scheme, where sites used for greater than a single night will be given priority, as these sites likely provided the birds more resources than those used for just one night. Furthermore, we will prioritize sites based on proximity to the Platte River by maintaining a third field crew (see below). Overall, we plan to gather data at as many sites as feasible, while maintaining sites used for multiple days and those closest to the Platte River as priority.

### **Fieldwork coordination**

To facilitate a time-sensitive data collection strategy, we will staff and deploy 2 field crews. One field crew will be stationed at Northern Prairie Wildlife Research Center in Jamestown, ND, whereas the other will be stationed at the Crane Trust, near Wood River, NE. To reduce costs but maintain a safe work situation, each field crew will consist of a paid biological technician and a biological intern. To ensure that stopover sites in Nebraska are not missed, an additional crew comprised of Crane Trust and Program staff will be formed, as necessary, to visit sites if primary field crews are out of the area. A lead technician will take primary responsibility in contacting landowners and directing field crews. Furthermore, the lead technician will finalize input of data into electronic format, perform preliminary analyses, and write reports as required.

### **SIGNIFICANCE TO PROGRAM**

Information learned from site visits will be directly relevant to several Program questions, including:

*Do whooping cranes use Program habitat complexes and/or habitat meeting Program minimum criteria in proportions greater than their availability?*

*What is the relationship between availability of whooping crane roosting habitat meeting Program minimum criteria and whooping crane use?*

By greatly increasing the sample size of stopover sites used by whooping cranes, this study will assist in refining minimum habitat criteria, as currently proposed in the Draft Whooping Crane Minimum Habitat Criteria document (8/1/12). Such refinement of the criteria, if warranted, will enable refinement of restoration targets for whooping crane habitat along the Platte River.

*How does whooping crane use of the central Platte River relate to overall population recovery objectives?*

The study also will provide information about the importance of the Platte River relative to other rivers and wetlands within a day's flight for provision of habitat for whooping cranes. The role of the Platte River may be seasonally or annually variable, and by characterizing stopover locations over several migration seasons we will capture some of those dynamics. This kind of knowledge will support overall population recovery objectives by highlighting scenarios (climatic or otherwise) when the Platte River plays an especially important role as a migration stopover.



Furthermore, this proposed project adds value to existing Program-supported research and activities related to whooping cranes. For example, some measures will be comparable to measurements taken during site assessments along the Platte River and will thereby provide a direct comparison of other rivers to Platte River use sites. Data collected from this study will be available for incorporation with the whooping crane sightings database; the detailed, timely site characterizations will add information that is often missing from historical sightings. These site visits also will strengthen the broader telemetry study and permit researchers to take advantage of this unpredicted opportunity to characterize remote sites that would likely have gone undetected. Finally, this research will contribute to educational and outreach activities, as the project's outcomes are amenable to presentation to broad audiences, which helps further the Program's objective of including public in management and research process.

## **ROLES AND RESPONSIBILITIES**

### **U.S. Geological Survey**

- Administration of grant and guidance of overall project
- Provision of cooperative agreement with Crane Trust to support characterization of riverine stopover locations in Nebraska (autumn migration 2012-spring migration 2014)
- Staffing of biological technicians, in coordination with Tern/Plover monitoring crew
- Oversight and leading role in data analysis and interpretation, presentations, and report/manuscript preparation
- Provision of lodging facilities for one field crew
- Coordination with overall Whooping Crane Telemetry Project and assurance of data quality of telemetry-marked birds

### **The Crane Trust**

- Implementation of cooperative agreement with USGS to characterize riverine stopover locations in Nebraska (autumn migration 2012-spring migration 2014)
- Support of project lead (with some costs offset by USGS cooperative agreement) to coordinate field crews, downloading of location data, contacting land owners, entering data, assisting with data analysis, writing reports and manuscripts.
- Support of personnel to lead data analysis, interpretation, presentations, and report/manuscript preparation
- Provision of lodging facilities for one field crew
- Provision of stipend for 2 interns to assist biological technicians
- Partial support of staff time and travel expenses to non-riverine stopover sites within Nebraska
- Coordination of public outreach components of the project to provide periodic updates on research activities and outcomes to broad audiences

### **Program**

- Funding for biological technicians, field crew travel, field equipment and supplies
- Staff time and travel costs related to non-riverine stopover sites within Nebraska, if necessary

- Input into data analysis and interpretation, presentations, and report/manuscript preparation
- Purchase and maintain two field-rated laptop computers and two digital cameras for use by technicians. Computers will require ESRI ArcGIS and MS Office software and mobile data plans.

#### **EXPECTED OUTCOMES**

- Creation of a database that characterizes habitats and associated land management at sites used as stopover locations by whooping cranes that is compatible and complementary to existing Program whooping crane database.
- Summarization and interpretation of habitat characteristics within different types of use sites.
- Comparison among riverine and wet meadow use sites in and out of the Program area.
- Documentation of current and historical land management practices to determine activities compatible with crane use.
- Visual documentation of sites (photography).
- Baseline database for future comparison in relation to novel or changing threats.
- Potential identification of sites used repeatedly over the period of record, leading to targeted conservation of specific areas or regions.

#### **PRODUCTS**

- Annual progress reports, provided to the EDO on pre-defined schedule
- Presentation of annual progress at yearly Adaptive Management meetings
- Publications in peer-reviewed scientific journals

#### **BUDGET (SEE ATTACHED)**

## **BUDGET JUSTIFICATION**

### **Personnel**

- USGS and Crane Trust professional staff. Funded by host organizations; Aaron Pearse, Dave Brandt, and Mary Harner will provide 1 month to project each year.
- Project lead. Partially funded by USGS cooperative agreement to Crane Trust, remaining time provided in-kind from the Crane Trust to coordinate field crews, downloading of location data, contacting land owners, entering data, assisting with data analysis, writing reports and manuscripts.
- Two field crews consisting of two persons employed by USGS (working on tern/plover monitoring crew when not assigned to this project). The other two field crewmembers will be interns supported by the Crane Trust.

### **Field station lodging**

- Field crews will be stationed at Northern Prairie Wildlife Research Center and at the Crane Trust. Each entity will cover costs associated with lodging staff at their facilities.

### **Travel**

- Each crew will need to stay away from their respective home base during each migration to maintain an efficient work schedule. We anticipate each crew requiring lodging for 25 nights during each 3-month migration season. Lodging and a per diem will be paid to field crews when away from their field station. The Crane Trust will support additional travel costs within Nebraska, as necessary, for project lead.
- Field crews will use USGS vehicles. The Crane Trust will provide an additional vehicle for use by project lead in instances where additional field assistance is required.
- Vehicle gas will be for use in USGS field vehicles.
- Professional staff anticipate travel for collaboration meeting, professional meetings, and to provide updates to Program staff at annual Adaptive Management meeting.

### **Equipment & Supplies**

- Field crews require field-rated laptops and the project lead requires a mobile workstation.
- Field crews require range finders, GPS units, and cameras to complete data collection.
- Ownership must be established using maps. USGS and Program maintain some maps, and the grant will be used to purchase unavailable county maps.
- Other field supplies as needed.

### **Telecommunications**

- Project will require data plans for cellular phones to retrieve satellite data from field (2 plans for field crews, 1 plan for project lead when in field).

## **BUDGET DESCRIPTION**

### **PRRIP request**

#### Salaries and wages

2 GS-6 term biological technicians for 12 pay periods each (pay period = 2 weeks)  
2 technicians X 12 pay periods X \$1,820 per pay period = \$43,680

#### Travel

Field lodging and per diem; planning for each crew to spend 25 nights out each migration  
\$77/night for hotel; \$46/day meals and incidental expenses  
(2 persons X 46) + 77 = \$169/day  
\$169 X 50 days X 2 crews = \$16,900

#### Gas

5000 miles/crew/migration season; 20,000 miles total  
\$4/gal fuel cost; fuel mileage 10mi/gal  
20,000 miles / 10 = 2000 gal; 2000 gallons X \$4 = \$8,000

#### Equipment and supplies

##### Plat maps

SD 25 at \$43 = \$1075; KS 30 at \$30 = \$900; OK 30 at \$30 = \$900 (estimate);  
TX 15 at \$30 = \$450 (estimate)

##### Miscellaneous field supplies

### **USGS contributions**

#### Salaries and wages

USGS Professional Staff (pay period = 2 weeks)  
2 pay periods @ \$3946 per pay period for Pearse  
2 pay periods @ \$3391 per pay period for Brandt  
Project lead – providing support for project lead via Cooperative Agreement

#### Field station lodging

\$3.75/day/person X 180 days X 2 persons = \$1,350

#### Travel

##### Vehicles

USGS will provide vehicles for the project. Rates are \$250/mo + \$0.25/mi  
2 vehicles X 6 months X \$250 = \$3,000  
10,000 miles/year/vehicle (20,000 miles); \$0.25/mi X 20,000 = \$5,000

##### Other travel

Travel to AMP reporting session and other travel associated with professional staff

### Equipment and supplies

Computer for use by Lead Technician

GPS units, range finders already owned by USGS will be used

Plat maps for NE and ND will be provided by USGS

Misc supplies

    Sampling supplies for water and soil

### Telecommunications

Data plan for project lead

## **Crane Trust contributions**

### Salaries and wages

Crane Trust Professional Staff (pay period = 2 weeks)

    2 pay periods @ \$3365 per pay period for Harner

    1.5 pay period @ \$3500 per pay period for GIS analyst

Interns

    \$550/month X 6 months X 2 persons = \$6,600

Project Lead – providing support for project lead after completion of Cooperative Agreement

### Field station lodging

    \$300/month X 6 months X 2 persons = \$3,600

### Travel

Vehicles

Crane Trust will provide vehicle for project lead. Rates are \$0.54/mi

    1,500 mi/yr X \$0.54/mi = \$810

Other travel

    Travel to AMP reporting session and other travel associated with professional staff

Expense Line Item	PRRIP - Request					USGS - Cost Share				
	2013	2014	2015	2016	Total	2013	2014	2015	2016	Total
<b>Salaries and Wages</b>										
Professional (USGS & CT)					\$ -	\$ 14,674	\$ 14,674	\$ 14,674	\$ 14,674	\$ 58,696
Project Lead (CT)					\$ -	\$ 18,750	\$ 19,500	\$ 20,000		\$ 58,250
Biotech (2, 6 mo)	\$ 43,680	\$ 43,680	\$ 43,680		\$ 131,040					\$ -
Intern (2, 6 mo)					\$ -					\$ -
<b>Total Salaries</b>	\$ 43,680	\$ 43,680	\$ 43,680		\$ 131,040	\$ 33,424	\$ 34,174	\$ 34,674	\$ 14,674	\$ 116,946
<b>Field station lodging</b>					\$ -	\$ 1,350	\$ 1,350	\$ 1,350		\$ 4,050
<b>Travel</b>										
Field Lodging and Per diem	\$ 16,900	\$ 16,900	\$ 16,900		\$ 50,700					\$ -
Vehicles					\$ -	\$ 8,000	\$ 8,000	\$ 8,000		\$ 24,000
Gas	\$ 8,000	\$ 8,000	\$ 8,000		\$ 24,000					\$ -
Other travel					\$ -	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 6,000
<b>Total Travel</b>	\$ 24,900	\$ 24,900	\$ 24,900		\$ 74,700	\$ 9,500	\$ 9,500	\$ 9,500	\$ 1,500	\$ 30,000
<b>Equipment &amp; Supplies</b>										
Computers					\$ -	\$ 5,400				\$ 5,400
Plat maps	\$ 3,325				\$ 3,325	\$ 1,675				\$ 1,675
Misc supplies	\$ 500	\$ 500	\$ 500		\$ 1,500	\$ 2,000	\$ 2,000			\$ 4,000
<b>Total equip and supplies</b>	\$ 3,825	\$ 500	\$ 500		\$ 4,825	\$ 9,075	\$ 2,000			\$ 11,075
<b>Telecommunications</b>					\$ -	\$ 600	\$ 600	\$ 600		\$ 1,800
<b>Total direct costs</b>	\$ 72,405	\$ 69,080	\$ 69,080	\$ -	\$ 210,565	\$ 53,949	\$ 47,624	\$ 46,124	\$ 16,174	\$ 163,871
<b>Cost center rate 25.9%</b>	\$ 18,753	\$ 17,892	\$ 17,892	\$ -	\$ 54,536	\$ 13,973	\$ 12,335	\$ 11,946	\$ 4,189	\$ 42,443
<b>Subtotal 1</b>	\$ 91,158	\$ 86,972	\$ 86,972	\$ -	\$ 265,101	\$ 67,922	\$ 59,959	\$ 58,070	\$ 20,363	\$ 206,314
<b>Bureau rate 12%</b>	\$ 10,939	\$ 10,437	\$ 10,437	\$ -	\$ 31,812	\$ 8,151	\$ 7,195	\$ 6,968	\$ 2,444	\$ 24,758
<b>CT indirect 20%</b>										
<b>Total requested funds</b>					\$ 296,913					
Program Computers (2)	\$ 7,000	\$ -	\$ -	\$ -	\$ 7,000					\$ -
Data Plans (2)	\$ 1,200	\$ 1,200	\$ 1,200	\$ -	\$ 3,600					\$ -
<b>Total proposed budget</b>	\$ 102,097	\$ 97,408	\$ 97,408	\$ -	\$ 307,513	\$ 76,072	\$ 67,154	\$ 65,039	\$ 22,807	\$ 231,071
<b>Percentage of Project costs</b>					46%					35%

Expense Line Item	CT - Cost Share					Total Project Cost				
	2013	2014	2015	2016	Total	2013	2014	2015	2016	Total
<b>Salaries and Wages</b>										
Professional (USGS & CT)	\$ 11,980	\$ 11,980	\$ 11,980	\$ 11,980		\$ 26,654	\$ 26,654	\$ 26,654	\$ 26,654	\$ 58,696
Project Lead (CT)				\$ 21,090	\$ 21,090	\$ 18,750	\$ 19,500	\$ 20,000	\$ 21,090	\$ 79,340
Biotech (2, 6 mo)					\$ -	\$ 43,680	\$ 43,680	\$ 43,680	\$ -	\$ 131,040
Intern (2, 6 mo)	\$ 6,600	\$ 6,600	\$ 6,600		\$ 19,800	\$ 6,600	\$ 6,600	\$ 6,600	\$ -	\$ 19,800
<b>Total Salaries</b>	\$ 18,580	\$ 18,580	\$ 18,580	\$ 33,070	\$ 88,810	\$ 95,684	\$ 96,434	\$ 96,934	\$ 47,744	\$ 336,796
<b>Field station lodging</b>	\$ 3,600	\$ 3,600	\$ 3,600	\$ -	\$ 10,800	\$ 4,950	\$ 4,950	\$ 4,950	\$ -	\$ 14,850
<b>Travel</b>										
Field Lodging and Per diem					\$ -	\$ 16,900	\$ 16,900	\$ 16,900	\$ -	\$ 50,700
Vehicles	\$ 810	\$ 810	\$ 810	\$ -	\$ 2,430	\$ 8,810	\$ 8,810	\$ 8,810	\$ -	\$ 26,430
Gas					\$ -	\$ 8,000	\$ 8,000	\$ 8,000	\$ -	\$ 24,000
Other travel	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 6,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 12,000
<b>Total Travel</b>	\$ 2,310	\$ 2,310	\$ 2,310	\$ 1,500	\$ 8,430	\$ 36,710	\$ 36,710	\$ 36,710	\$ 3,000	\$ 113,130
<b>Equipment &amp; Supplies</b>										
Computers					\$ -	\$ 5,400	\$ -	\$ -	\$ -	\$ 5,400
Plat maps					\$ -	\$ 5,000	\$ -	\$ -	\$ -	\$ 5,000
Misc supplies					\$ -	\$ 2,500	\$ 2,500	\$ 500	\$ -	\$ 5,500
<b>Total equip and supplies</b>					\$ -	\$ 12,900	\$ 2,500	\$ 500	\$ -	\$ 15,900
<b>Telecommunications</b>					\$ -	\$ 600	\$ 600	\$ 600	\$ -	\$ 1,800
<b>Total direct costs</b>	\$ 24,490	\$ 24,490	\$ 24,490	\$ 34,570	\$ 108,040	\$ 150,844	\$ 141,194	\$ 139,694	\$ 50,744	\$ 482,476
<b>Cost center rate 25.9%</b>						\$ 32,726	\$ 30,226	\$ 29,838	\$ 4,189	\$ 96,979
<b>Subtotal 1</b>						\$ 159,080	\$ 146,930	\$ 145,042	\$ 20,363	\$ 471,415
<b>Bureau rate 12%</b>						\$ 19,090	\$ 17,632	\$ 17,405	\$ 2,444	\$ 56,570
<b>CT indirect 20%</b>	\$ 4,898	\$ 4,898	\$ 4,898	\$ 6,914	\$ 21,608	\$ 4,898	\$ 4,898	\$ 4,898	\$ 6,914	\$ 21,608
Program Computers					\$ -	\$ 7,000	\$ -	\$ -	\$ -	\$ 7,000
Data Plan					\$ -	\$ 1,200	\$ 1,200	\$ 1,200	\$ -	\$ 3,600
<b>Total proposed budget</b>	\$ 29,388	\$ 29,388	\$ 29,388	\$ 41,484	\$ 129,648	\$ 207,557	\$ 193,950	\$ 191,835	\$ 64,291	\$ 668,233
<b>Percentage of Project costs</b>					19%					