TO: Governance Committee (GC)
FROM: Executive Director's Office (EDO)
SUBJECT: Habitat Availability Assessments
DATE: February 23, 2012

Request

The EDO requests GC approval to enter into a sole-source Agreement with the Rainwater Basin Joint Venture (RWBJV) for completing tern and plover (LTPP) and whooping crane (WC) habitat availability assessments in the central Platte River associated habitats for the 2007 and 2012 LTPP nesting seasons and 2007–2012 WC migration seasons. Funding for work under this Agreement is estimated at **$143,227** and would come from Program budget line item IMRP-6 (Habitat Availability Analysis), as approved by the Governance Committee (GC) in December 2011. The Technical Advisory Committee (TAC) voted to support this work in January 2012.

Summary of work to be performed:

- Addition of years 2007 and 2012 to current LTPP habitat availability assessment scope of work (current scope is 2008–2011)
- WC habitat availability assessment for 2007–2012 (six assessment years)

Background

In May 2011, the GC approved entering into a sole-source Agreement with RWBJV to perform four LTPP habitat availability assessments (2008–2011) using remote sensing. In October 2011, RWBJV presented results from the first year (2008) LTPP assessment to the TAC. The RWBJV discussed the methodology and shared the results, which were received well by the TAC. The EDO believes the same techniques can be applied in assessing habitat availability for whooping cranes, and contacted the RWBJV to assess their interest in the project and to discuss a project approach. As such, the EDO asked the RWBJV to develop a scope and fee that provided for time and equipment commitment sufficient to perform two additional LTPP habitat availability assessments and six WC habitat availability assessments that would be similar to the LTPP habitat availability assessments, but with more (and more complicated) criteria as defined by the TAC.

In November 2011, the EDO sought TAC support to enter into an Agreement with RWBJV to complete this project, but lacked full support by the TAC without having defined the WC Minimum Habitat Criteria and what the deliverables of the WC habitat availability assessments would be.

In December 2011, the EDO asked Western EcoSystems Technology (WEST) to provide a cost estimate to perform the 2007–2012 WC habitat availability assessment portion of this project. WEST is currently under contract with the Program to conduct spring/fall WC monitoring and associated data analysis. WEST estimated it would cost $75,000 – $110,000 to complete the first year WC habitat availability assessment and $35,000 for each of the five additional years ($250,000 – $285,000 total for the six WC assessments).

In January 2012, the TAC held a workshop and established WC Minimum Habitat Criteria. At the workshop, the TAC also discussed the scope of work and supported the initiation of this 2007 and 2012 LTPP and 2007-2012 WC Habitat Availability Assessments project. Clayton Derby of WEST participated in the Workshop and was asked if he felt the cost estimate WEST provided originally ($250,000-$285,000) would change as a result of the Workshop. Derby stated that based on the workshop discussion and his current understanding of the scope of work, WEST's estimate would likely be higher than they initially planned.

For this assessment, RWBJV proposed a much more collaborative project approach than was presented for the 2008–2011 LTPP habitat availability assessment (TPHAA) work. With this approach, the TAC would retain a great deal of flexibility in the project as they further refine WC Minimum Habitat Criteria during 2012. The proposed Agreement is set up as a firm fixed-price Agreement that would span from approximately March 2012 through December 2013. Under this Agreement, the RWBJV would perform the LTPP habitat availability assessments for 2007 and 2012, create land cover classification of annual aerial photography pertinent to WC habitat for 2007–2012, create and employ a variety of data inputs such as channel widths and unobstructed view widths, make use of Program LiDAR and 1D model outputs, and merge all of these pieces to create a spatial model of annual WC habitat availability.

The RWBJV has extensive experience with spatial modeling and imagery analysis which are key components of the habitat availability assessment. Imagery analysis requires very expensive specialized software and requires high-powered computers, and even then can take multiple days of computer processing time to complete. The RWBJV already possesses the specialized hardware and software necessary to perform the work, have been doing these types of assessments for a number of years, and have already successfully applied these skills to the 2008-2011 TPHAA for the Program.

The RWBJV's project area, being located in south-central Nebraska adjacent to much of the PRRIP associated habitats, offers familiarity with the habitats found in the Platte basin and experience modeling these habitats. Some of the assessments performed by RWBJV in the past (aside from PRRIP's 2008-2011TPHAA) include modeling of potential sandhill crane roost habitat, lesser prairie chicken habitat, and quality and availability of habitat for migratory waterfowl in the Rainwater Basins. There is a fair amount of skill involved in refining results of the computer modeling process so familiarity with the area will be very valuable in producing the best results possible. RWBJV's physical location near the central Platte will make for a stronger working relationship with the Program through the EDO and TAC.

Budget Estimate

Table 1 below provides detail on budget categories and estimated costs for performing the 2007-2012 Annual Whooping Crane Habitat Availability Assessment Scope of Work (Appendix A) and the additional LTPP habitat availability assessment work (current scope in Appendix B). The Agreement for this work is included in Appendix C. Final delivery for this project is scheduled for December 31, 2013, with a total estimated cost of $143,227. Funding for annual LTPP and WC habitat availability assessments in 2013 and beyond was estimated at $20,000 and could be conducted by RWBJV through an amendment to this Agreement or possibly completed by the EDO depending on the results of the 2007–2012 work. All funding estimates are built into line item IMRP-6 in the 2012 Program Budget approved by the GC in December 2011.

Table 1. Proposed budget estimates for completing the 2007 and 2012 tern and plover habitat availability assessments and the 2007–2012 whooping crane habitat availability assessments. Entire project budget is included in the 2012 Program Budget and will be dispensed on a percent-complete basis.

Project Items	2012	2013	Total Cost
Tern and Plovers (Two Assessment Years, 2007 & 2012) technician time	$ 9,000		$ 9,000
Whooping Cranes (Six Assessment Years, 2007–2012) technician time	$ 62,550	$ 31,275	$ 93,825
RWBJV Analyst; Quality Assessment/Control for Datasets	$ 10,068	$ 5,034	$ 15,102
Computer Hardware	$ 18,300	$ -----	$ 18,300
Workstations	$ 7,000	$ -----	$ 7,000
Totals	$106,918	$ 36,309	$ 143,227

APPENDIX A

WC HABITAT AVAILABILITY ASSESSMENT SCOPE OF WORK

2007-2012 Annual Whooping Crane Habitat Availability Assessment
SCOPE OF WORK

This Scope of Work presents a brief outline of the Program's whooping crane habitat availability assessment needs. In addition to developing a Methods document during the course of assessing Year 1 data, the work will include conducting six (6) habitat availability assessments for the timeframe of 2007–2012. Separate reports will be generated for each year and results from each assessment will be summarized and presented at a Program Adaptive Management Plan Reporting Session. All assessments must be completed and deliverables submitted to the Program by December 31, 2013.

Area of Interest:
Program associated habitat reach from Lexington downstream to Chapman, Nebraska (Approx. 90 miles). *In-channel habitat availability assessments confined to active channels of the Platte River. Off-channel habitat availability assessments confined to features <3.5 miles of the main channel or 2 miles of a side channel of the central Platte River, whichever is wider.*

Information Availability:

- Annual Data Collection
    - June Color-Infrared Imagery of the associated habitats (2-ft Resolution) acquired May-July annually.
    - Bare earth DEMs and LiDAR point data in .las format for 2009, 2010, 2011, and 2012 (2007 and 2008 assessments will use 2009 data).
    - Whooping crane monitoring data including habitat characteristics at use locations (river profiles, roost depth, unobstructed view width, distance to obstruction, habitat type, etc).
    - Geomorphology and vegetation monitoring data including topographic and vegetation characteristics at Program anchor point locations.
    - Detailed river flow data at five locations along the associated habitat reach.
    - Habitat construction/maintenance activities in the associated habitats.
- Assessment Resources / Tools
    - HEC-RAS modeled DEM rasters for three water surfaces (1,700cfs, 2,400cfs, and observed flow during each migration season).
    - 2007 land use/cover GIS coverage for associated habitats.
    - Other spatial datasets available as needed (ex. Property boundaries, management and restoration activities, etc).
    - Program whooping crane habitat parameters including habitat type, channel width, distance to obstruction, unobstructed view width, water depth, distance to disturbance, etc.
    - Program-defined minimum habitat criteria necessary to filter areas deemed available habitat will likely be refined and updated based on results of the first year's assessment. As criteria are refined based on Year 1 assessment results, assessments may be run multiple times with different criteria sets.

General Processing Procedure

1) Perform land cover classification on annual imagery using eCognition (or similar image recognition software). Land cover types will be determined based on necessary WC habitat variables and are likely to include classes such as grass, trees, shrubs, water, bare sand, etc.
    a. NOTE: Field verification/training data/accuracy assessment may be required
2) Use available datasets to sequentially filter "available WC habitat" from land cover classification.
    a. In-channel Habitat Classification:
        i. Unobstructed Channel Width ≥280 feet
        ii. Channel Roost Depth ≤8 inches
        iii. Distance to Obstruction ≥75 feet
        iv. Wetted Width ≥250 feet
        v. Unobstructed View Width ≥330 feet
        vi. ≥40% of the channel area ≤8 inches or bare sand
        vii. Distance to Disturbance ≥160 feet
        viii. Distanced to Bridge ≥1,320 feet (0.25 mile)
    b. Off-channel Habitat Classification
        i. ≤3.5 miles of the main channel or ≤2 miles of a side channel
        ii. Corn, soybean, alfalfa, wheat, grassland, and palustrine wetland
        iii. Distance to Obstruction ≥75 feet
        iv. Unobstructed View Width ≥330 feet
        v. Distance to Disturbance ≥160 feet
    c. Palustrine Wetland filters:
        i. ≥5 acres of water area ≤18 inches deep
        ii. ≥25% of the water area ≤12 inches deep
        i. at least 1 water area that is 500 feet × 500 feet
    d. Wet meadow filter:
        i. Clip grassland component with wet meadow layer file created by the Program's Wet Meadow Working Group
    e. NOTE: All specific criteria above are given for the purpose of completing the Year-1 Assessment. Exact numbers and criteria will likely be modified throughout the project
3) Assemble assessment results and outputs in a geodatabase with fields to be determined.
4) Report habitat availability numbers through various breakdowns such as by bridge segment, in-channel (sandbar, shallow water, etc) and out of channel habitat (wet meadow, wetland, agricultural field by type, etc).

Deliverables:

1) Methods Document to be reviewed by the EDO and TAC following the assessment of Year 1 data that at a minimum includes processing steps & software packages used to complete each procedure as well as various criteria, masks, etc. used to parse out suitable habitat including how they were derived.

2) ‘Ground-truth’ results using on-site visits, the Program’s whooping crane monitoring data, geomorphology and vegetation monitoring data, habitat creation/maintenance files, and other geo-referenced data to ensure areas defined as ‘habitat’ are suitable for whooping crane use.
3) Six annual summary reports presenting habitat availability (acres) by year, class (on- and off-channel), and type (sandbar, shallow channel, wet meadow, palustrine wetland, grassland, and agricultural field by type) in the associated habitat reach.
4) Geodatabase of available habitat organized by year, class, and type
5) Assistance in preparation of presentation materials for an Adaptive Management Plan Reporting Session (figures, data, and methods interpretation).

APPENDIX B

2008-2011 LTPP HABITAT AVAILABILITY ASSESSMENT SCOPE OF WORK

Deliverables:

1) Summary report presenting habitat availability (acres) and trends by class (on and off-channel) for each bridge segment in the associated habitat reach. In-channel habitat availability may be calculated at two separate flow levels. Report should document assumptions used to filter habitat, and generally describe methods used to perform analysis. These reports may be combined for the 2008 to 2011 yearly analyses.
2) Geodatabase of available habitat organized by class and year.
3) Detailed methods document (protocol) covering procedures and assumptions, sufficient to allow recreation of work products given same or similar software.
4) Assistance in preparation of presentation for annual Adaptive Management Plan Reporting Session (figures, data and methods interpretation).

Scope of Services Tasks:

Phase 1 – Initial data preparation and vegetation classification

1) Tasks
    a. Data preparation
        i. Develop mask layers (analysis boundaries)
        ii. Prepare imagery (mosaic, degrade)
    b. Imagery processing
        i. Imagery segmentation in Definiens Earth
        ii. Training data creation for vegetation classes (bare sand, water, vegetation)
        iii. Computer classification of segmented imagery
        iv. Photo-interpretation of computer classification (QA/QC step)
2) Schedule
    a. Phase 1 tasks to be completed within 6 months of notice to proceed. At least one year of data will be available for review within 3 months of notice to proceed.
3) Budget
    a. Phase 1 tasks estimated at approximately 960 hours, billed at $30 per hour ($28,800)

Phase 2 – Incorporation of elevation data and other inputs to habitat classification model

1) Tasks
    a. Data preparation
        i. Work with Program to finalize habitat filter criteria
        ii. Inventory of available data inputs
        iii. Processing of LiDAR or HEC-RAS outputs as needed

b. Model creation
   i. Use established criteria and available input layers create habitat model for in-channel and off-channel habitat
   ii. Computer model classification of available habitat (in-channel and off-channel)
   iii. Photo-interpretation of computer classification (QA/QC step)

2) Schedule
   a. Phase 1 tasks to be completed within 9 months of notice to proceed. At least one model year available for review within 6 months of notice to proceed.

3) Budget
   a. Phase 2 tasks estimated at approximately 400 hours, billed at $30 per hour ($12,000)

Phase 3 – Geodatabase creation and reporting

1) Tasks
   a. Geodatabase construction
      i. Work with Program to finalize geodatabase structure
      ii. Incorporate model results of available in-channel and off-channel habitat into database (one geodatabase will contain all model years)
   b. Reporting
      i. Creation of detailed methods document (protocol) including inputs, assumptions, software used, software settings, etc, sufficient to allow recreation of work products given same or similar software.
      ii. Creation of draft report discussing modeled habitat availability, trends, general analysis methods, model assumptions, and other appropriate information (one report including model years 2008, 2009, 2010, and 2011)
      iii. Creation of final report incorporating Program review and comment
      iv. Assistance in preparation of figures, interpretation of methods and results, etc for Program presentation at the annual Adaptive Management Plan Reporting Session

2) Schedule
   a. Phase 3 tasks to be completed within 12 months of notice to proceed. Draft report available for review within 10 months of notice to proceed.

3) Budget
   a. Phase 3 tasks estimated at approximately 240 hours, billed at $30 per hour ($7,200)

<u>Information/Data to be provided by Program</u>:

1) Digital elevation model (DEM) rasters for water surfaces at 1,200 cfs and 3,600 cfs.
2) Bare earth DEMs from LiDAR data flown in 2009, 2010, and 2011 in Nebraska State Plane feet horizontal coordinate system and NAVD 1988 elevations in feet (2008 analysis will use 2009 elevation data).
3) LiDAR point data in .las format for 2009, 2010, and 2011 (2008 analysis will use 2009 elevation data). 2009 and 2010 .las files are projected in UTM NAD 83 Zone 14N, horizontal and vertical units are in meters (NAVD 88).

4) Color infra-red aerial photography at 2-foot resolution or better for the project area acquired May-July annually.
5) Program geomorphology and vegetation monitoring data.
6) Other spatial datasets available as needed (ex. Property boundaries, management and restoration activities, etc).
7) Final determination of habitat criteria necessary to filter areas deemed available suitable habitat.

APPENDIX C

2007 & 2012 LTPP AND 2007–2012 HABITAT AVAILABILITY ASSESSMENT AGREEMENT

PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM
AGREEMENT FOR SERVICES

Agreement between the Nebraska Community Foundation, Inc.,
Platte River Recovery and Implementation Program, and
Rainwater Basin Joint Venture

1. Parties.
This Agreement is made and entered into by and between the Nebraska Community Foundation, Inc. (Foundation) of Lincoln, Nebraska, representing all signatories to the Platte River Recovery Implementation Program, hereinafter referred to as "Program," and the Rainwater Basin Joint Venture (RWBJV). The following persons are authorized to represent the parties through this Agreement: Diane Wilson of the Foundation; Dr. Jerry Kenny of the Program; and Andy Bishop of the RWBJV.

2. Purpose.
The purpose of this Agreement is to allow the Foundation, acting as the fiscal agent for the Governance Committee of the Program, and the RWBJV to enter into a firm fixed-price agreement for services rendered in performing the 2007 and 2012 Tern and Plover (LTPP) Habitat Availability Assessments and the 2007-2012 Whooping Crane (WC) Habitat Availability Assessments.

TERMS AND CONDITIONS.

3. Scope of Services.
The RWBJV will complete the scope of work described in Attachment A. This agreement will serve as the official Notice to Proceed to the RWBJV. The Foundation shall be responsible only for the financial aspects of the RWBJV's relationship with the Program. Technical aspects of the RWBJV's relationship with the Program will be the sole responsibility of the Program Executive Director's Office. Justin Brei of the Executive Director's Office will serve as RWBJV's point of contact for this project.

4. Deliverables and Schedule.
The rough schedule for this effort is as follows:

March 15, 2012	Agreement signed/Notice to proceed with project
August 31, 2012	Drafts of Year-1 WC Assessment results and methods document presented to TAC
December 31, 2012	Final Reports for 2007 & 2012 LTPP assessments provided to ED Office
December 31, 2013	Final Annual Reports for six WC assessments provided to ED Office

Other deliverables will include the geodatabase and associated electronic files described in Attachment A. Draft reports will be provided to the Program Executive Director's Office in Microsoft Word format for distribution and review. Final reports will be provided to the Program Executive Director's Office in PDF format.

Compensation.
Compensation will occur for work in accordance with the approved scope of services and will not exceed a total of $143,227 unless the scope and budget are modified and mutually agreed upon by the parties. See RWBJV's budget in Attachment B for detailed budget description.

RWBJV shall provide written requests for payment to the ED Office (address included below). RWBJV may submit partial billing on a percent completed basis. Invoices should be accompanied by a summary of work completed under the invoice. Invoices should be submitted no less than twice per year. Request for final payment shall be submitted along with final deliverables. The Program's Executive Director, upon receiving a bill, will approve the bill and advise the Foundation of approval. The Foundation will make payment of these funds directly to the RWBJV within 30 days. Payments of bills are due within 60 days after the billing date.

5. Other space, equipment and supplies.
The RWBJV will supply its own office space, equipment, and supplies.

6. Amendments and Termination.
This Agreement, scope, and budget may be amended by mutual written consent of the parties pursuant to the Program. This agreement may be terminated with 30 days notice by any party.

7. Agreement contingent upon available funding.
This Agreement is contingent upon funding availability and continuation of the Platte River Recovery Implementation Program.

8. Indemnification.
To the extent authorized by law, the contractor shall indemnify, save, and hold harmless the Nebraska Community Foundation; the states of Colorado, Wyoming, and Nebraska; the Department of the Interior; members of the Governance Committee; and the Program Executive Director's Office, their employees, employers, and agents; against any and all claims, damages, liability, and court awards including costs, expenses, and attorney fees incurred as a result of any negligent act or omission by the contractor or its employees, agents, subcontractors, or assignees pursuant to the terms of this project.

9. Inspection and Acceptance.
All deliverables furnished by the RWBJV shall be subject to rigorous review by the ED Office prior to acceptance.

10. Time Frame.
The initial date of this agreement shall be the date of signing and work will begin following receipt of data from annual aerial photography. The final date of this agreement shall be approximately December 31, 2013. This time frame may be extended upon mutual agreement of the parties and pursuant to the Program.

11. Independent Contractor.
The parties intend that the RWBJV will not be considered an employee of the Foundation, but will act as an independent contractor for the Foundation. As an independent contractor, the RWBJV will be responsible for all applicable taxes and is not eligible for any benefits provided by the Foundation.

12. Contacts.
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IN WITNESS WHEREOF, the Parties have executed this Agreement.

_____ Date: _____

Diane M. Wilson
Chief Financial and Administrative Officer
Nebraska Community Foundation
650 J Street, Suite 305
Lincoln, Nebraska 68501-3107
Phone: (402) 323-7330
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Email: dwilson@nebcommfound.org

_____ Date: _____

Andy Bishop
Rainwater Basin Joint Venture
2550 Diers Ave. Suite L
Grand Island, NE 68803
Phone: (308) 382-8112
Email: mailto:andy_bishop@fws.gov

ATTACHMENT A – SCOPE OF SERVICES

Deliverables:

1) Methods Document to be reviewed by the EDO and TAC following the assessment of Year 1 WC data that, at a minimum, includes processing steps & software packages used to complete each procedure as well as various criteria, masks, etc. used to parse out suitable habitat including how they were derived.
2) 'Ground-truthed' results using on-site visits, the Program's LTPP and WC monitoring data, geomorphology and vegetation monitoring data, habitat creation/maintenance files, and other geo-referenced data to ensure areas defined as 'habitat' are suitable for LTPP or WC use.
3) Geodatabase of available habitat for LTPP and WC organized by year, class, and type.
4) Detailed methods document (protocol) covering procedures and assumptions, sufficient to allow recreation of work products given same or similar software.
5) LTPP and WC summary reports presenting habitat availability (acres) and trends by class (on and off-channel) and type for each bridge segment in the associated habitat reach. In-channel habitat availability may be calculated at two separate flow levels for LTPP habitat assessments and at four separate flow levels for WC habitat assessments. Reports should document assumptions used to filter habitat, and generally describe methods used to perform assessments. These reports may be combined for the 2007-2012 yearly assessments.
6) Assistance in preparation of presentation materials for an Adaptive Management Plan Reporting Session (figures, data and methods interpretation).

General Assessment Scope of Service Tasks:

1) Tasks
   a. Data preparation
      i. Develop mask layers (analysis boundaries)
      ii. Prepare imagery (mosaic, degrade)
      iii. Inventory of available data inputs
      iv. Processing of LiDAR or HEC-RAS outputs as needed
   b. Imagery processing
      i. Imagery segmentation in Definiens Earth, eCognition, or similar software
      ii. Training data creation for vegetation classes (bare sand, water, vegetation by class, etc)
      iii. Computer classification of segmented imagery
      iv. Photo-interpretation of computer classification (QA/QC step)

c. Model creation
   i. Use established criteria and available input layers to create LTPP and WC habitat models for in-channel and off-channel habitat
   ii. Computer model classification of available LTPP and WC habitat (in-channel and off-channel)
   iii. Photo-interpretation of computer classification (QA/QC step)
d. Geodatabase construction
   i. Work with Program to finalize geodatabase structure
   ii. Incorporate model results of available in-channel and off-channel LTPP and WC habitat into databases (separate geodatabases will contain all model years, 2007-2012, for LTPP and WC)
e. Reporting
   i. Creation of detailed methods document (protocol) including inputs, assumptions, software used, software settings, etc, sufficient to allow recreation of work products given same or similar software.
   ii. Creation of draft report discussing modeled habitat availability, trends, general assessment methods, model assumptions, and other appropriate information (separate reports including model years 2007-2012 for LTPP and WC)
   iii. Creation of final reports incorporating Program review and comment
   iv. Assistance in preparation of figures, interpretation of methods and results, etc for Program presentations at an Adaptive Management Plan Reporting Session

2) Schedule
   a. 2007 & 2012 LTPP habitat availability assessments, geodatabase construction, and reports to be completed and submitted to the ED Office by December 31, 2012.
   b. Year-1 (2011) WC habitat availability assessment results and methods document presented to TAC by August 31, 2012.
   c. 2007–2012 WC habitat availability assessments, geodatabase construction, and reports to be completed and submitted to the ED Office by December 31, 2013.

<u>Information/Data to be provided by Program</u>:

1) Digital elevation model (DEM) rasters for water surfaces at 1,200 cfs and 3,600 cfs for LTPP assessments and 1,700cfs, 2,400cfs, and observed flows during spring and fall WC migration seasons for WC assessments.
2) Bare earth DEMs from LiDAR data flown in 2009, 2010, 2011, and 2012 in Nebraska State Plane feet horizontal coordinate system and NAVD 1988 elevations in feet (2007 & 2008 assessments will use 2009 elevation data).
3) LiDAR point data in .las format for 2009, 2010, 2011, and 2012 (2007 & 2008 assessments will use 2009 elevation data).
4) Color infra-red aerial photography at 2-foot resolution or better for the project area acquired May-July annually.
5) Program geomorphology and vegetation monitoring data.

6) Other spatial datasets available as needed (ex. Property boundaries, management and restoration activities, etc).
7) Minimum Habitat Criteria necessary to filter areas deemed available/suitable habitat.

ATTACHMENT B – BUDGET

Project Items	2012	2013	Total Cost
Tern and Plovers (Two Assessment Years, 2007 & 2012) technician time	$ 9,000		$ 9,000
Whooping Cranes (Six Assessment Years, 2007–2012) technician time	$ 62,550	$ 31,275	$ 93,825
RWBJV Analyst; Quality Assessment/Control for Datasets	$ 10,068	$ 5,034	$ 15,102
Computer Hardware	$ 18,300	$ -----	$ 18,300
Workstations	$ 7,000	$ -----	$ 7,000
Totals	$106,918	$ 36,309	$ 143,227