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April 9, 2009

## DECISION MEMORANDUM

**TO:** Council Members

**FROM:** Tony Grover, Director  
Fish and Wildlife Division

**SUBJECT:** BOG Management Group recommendation for *Habitat and Biodiversity Information System for Columbia River Basin*, #2003-072-00

**PROPOSED ACTION:** Approve the within-year project-funding request as defined and conditioned by staff.

### BUDGETARY/ECONOMIC IMPACTS

The total requested amount is \$64,294 in Fiscal Year 2009 expense funds. This amount is in addition to the Fiscal Year funding of \$157,831.

### BACKGROUND

As part of the second quarter of Fiscal Year 2009, the BOG reviewed 13 requests. Of these, eight requests were slated to have a recommendation from the Council at the May meeting.

Recently, on April 8, 2009, it was brought to the attention of the BOG Management Group that the request associated with Project #2003-072-00, *Habitat and Biodiversity Information System for Columbia River Basin* needed to be addressed prior to May. This was due to the failure of the projects main storage server on April 7, 2009.

The request was originally reviewed by the BOG on January 7, 2009 and was slated for a decision as part of the Council's recommendation regarding within-year requests, for the second quarter of Fiscal Year 2009 at the May Council meeting. At the time of the original request the project sponsor (Northwest Habitat Institute) requested \$64,294 (*work element description: To buy replacement hardware for equipment that is 5 years and older. Also to cover cost for re-installation, upgrading software and re-establishing network and systems in an orderly manner*) to address equipment replacement that was operation beyond its normal service life. In January the project had loss use of its plotter, but they were also aware of the needed attention for the other components that were out dated and aged (i.e., the server).

As part of the BOG request, detailed information regarding the request was provided (please see attachment 1). This support information is very detailed and complete.

The principal goal of the project is to develop common data sets and methods for fish and wildlife in regards to inventorying, monitoring, evaluating habitats, and to make this information available for planning purposes. This system is called Interactive Habitat and Biodiversity Information System (IBIS) spatial databases and its interactive Internet is recognized as a regional data and information system primarily for the terrestrial resources, with equal capabilities to address resident and anadromous fish habitat resources. These datasets are integral to subbasin planning efforts in that they provide species range maps, wildlife-habitat relationship maps and data. IBIS additionally serves as a source of core wildlife data that sets the foundation for a regional wildlife data repository

## **ANALYSIS**

It is important to note that this project is currently part of the Wildlife Category Review. Of the 36 projects that were reviewed by the ISRP, this project was one of the twelve that met “Scientific Review Criteria” (ISRP document 2009-7). The ISRP stated the following.

*Among other uses this information would be in future subbasin planning efforts. This product was used during subbasin planning in all subbasins. Regular updating is necessary to ensure current data are easily available to users. With advances in small scale mapping and data storage the product may be useful for monitoring of noxious weeds.*

*In the future ISRP recommends that more formal efforts be used to document use of the products produced by the project as well as to evaluate user satisfaction with services provided.*

This project has not received any funds for equipment upgrades or replacement since 2004. It seems at this time it is important to maintain and protect the integrity of the services (and data) that the project provides to the Columbia River basin. Additional detail regarding the future of the project, especially expansion, will be addressed as part of the Wildlife Category Review. Based on this understanding the Council staff recommends that the Council support this budget adjustment request.

**Attachment 1: Narrative attached, as part of the BOG request, providing detailed information for the budget adjustment. The request was submitted to the BOG web site on December 23, 2008. The information was reviewed by BOG on January 7, 2009.**

## **NHI System Hardware Evaluation**

**12-16-2008**

NHI has a current need to replace and upgrade our computer and network systems. Much of the equipment already in place is nearing the end of their optimal life expectancy. We fully expect that some of the existing equipment will still work for awhile prior to being completely obsolete. But we need to take steps now to ensure that our system is current and reliable to keep wildlife habitat information flowing and accessible to resource managers and the public alike.

New software realities have pushed the dissemination of information to web based formats that seamlessly integrate into enterprise GIS components from many different organizations. To better leverage these technologies we need to maintain and upgrade the project's hardware and software environment. Building upon a recent ~\$100,000 software and training grant from ESRI, the makers of the ArcGIS suite of products, we will be utilizing ArcGIS server software to disseminate and manage our geospatial data. This will allow us to better connect with clients producing data as well as those consuming it while simultaneously reducing the maintenance requirements of this complex system. This will better allow NHI to meet the needs of the subbasin planning process as well as connect to the NED metadata portal.

In 2003 and 2004, BPA purchased some (but not all) the hardware equipment that NHI uses to support our project (2003-072-00). Because of normal hardware life cycles, it is necessary to support a continual and periodic upgrade of essential components. New responsibilities also require new hardware to handle the load. During the past five years, NHI has not received the funding necessary to maintain and upgrade our hardware infrastructure. Because of this the hardware budget request reflects several years worth of upgrades. Had this project been fully supported, the hardware requests would have been incremental annually. In the interim, NHI has spent its own funding to increase our system capabilities, add new functionality and to maintain the system as it currently exists. As a non-profit company, we have actively pursued grant funding to support our program such as that received from ESRI and the Tech Soup Stock program that provides deeply discounted software to non-profits.

The hardware upgrades being proposed will allow NHI to move forward into the future with increasing capacity to serve clients and to deal with ever increasing sophistication of data storage and analysis techniques. Currently NHI is operating our SQL server 2005 software on our domain controller server. This is less than optimal in that our domain controller is quite old and is nearing capacity of its hard drive. Even with the relatively minimal data structure of our SQL database, this server is being taxed beyond its means. To remedy this situation we will be separating the SQL server functions from the domain controller onto its own stand alone server. This will allow for higher internal network speeds and smoother data flow between our web servers and the SQL database. Following this concept it is also essential to provide a stable and capable server environment for our ArcGIS server software. This software package valued

at \$40,000 per license is the lynchpin in the deployment of spatial data and the connections to the web portal. While NHI has secured this software via a grant, we are paying \$10,000 annually for maintenance fees and we still have yet to install this product. Once the hardware requirements are met this deployment will become feasible.

NHI is requesting funds to buy the following hardware items that would support project 2003-072-00. Below is a brief outline of each hardware request and the associated costs:

### **Servers:**

Currently NHI has a domain controller server and two web servers in operation. Our SQL software is installed on the domain controller, which is highly undesirable as almost all of the disk space has been consumed. The domain controller and SQL must be separated to handle any increase in SQL activity. Another server is also necessary to house and run ArcGIS server software. Estimated Cost: \$9,608

### **Storage:**

NHI is currently running at about 75% of capacity with our 1 TB Powervault storage server. However, we have much more data on CD, DVD, and magnetic tape that should be stored for public access. We are requesting funds to purchase an additional 4 TB storage server that should serve our storage needs for several years. Estimate Cost: \$4,643.

### **Network Peripherals:**

NHI currently relies on two 10/100 Base-T hubs to route our network traffic. These are outdated hubs that are almost ten years old. Virtually all of the rest of the computer equipment used at NHI is capable of gigabit performance. A new 24 port gigabit Ethernet switch will eliminate the need for two hubs while also providing the advantages of a switch over a hub in reducing traffic collisions. Estimated Cost: \$800

To fully convert to gigabit speeds, NHI will have to upgrade its current Fortinet Fortigate-60 hardware firewall to a Fortigate-110c model. This will allow for increased traffic speeds while providing the same or higher level of internet security and network flexibility that we have come to trust from our Fortinet products. Estimated Cost: \$3,500

Utilization of all of the hardware in the new gigabit Ethernet infrastructure will require a conversion from Cat-5 to Cat-6 cable. The Cat-5 cable will not handle the increased throughput of a gigabit environment. Estimated Cost: \$300

Our current configuration of hardware uses a 4-port (Keyboard/Video/Mouse) KVM switch to access each server. The KVM is already at capacity and will need to be upgraded to handle the additional servers listed above. Estimated Cost: \$835

To handle the power requirements of the new equipment, an additional rackmount UPS power supply will need to be purchased. The can be bundled with one of the server purchases to reduce the price. Estimate Cost: \$400

## **Plotter:**

NHI has been using a HP 755cm plotter secured by an HP grant to create maps and other hardcopy publications for resource managers and research staff for almost 10 years. Recently, this plotter has started to malfunction, for example, the main drive belt disintegrated and had to be replaced. Other signs of performance degradations have also become apparent. NHI needs to upgrade to a much newer and capable plotter to continue to provide these services at no or very low cost. The ink and paper are also an expense, but NHI has been covering these cost over the past 10 years.

Estimated Cost: \$9,000

## **Workstations:**

In keeping with the practice of continual renewal of our system assets, NHI is looking to purchase an additional GIS workstation. This is because one of our current laptops is doubling as a GIS workstation and should be retired soon. This older Dell Inspiron 8200 has performed well but with today technology requirements has proved its useful lifespan to be coming to a close. This will allow us to stay on the forefront of technology and will also help reduce our processing and analysis costs through higher performance. Estimated Cost: \$5,426

Our current GIS workstations were purchased with the maximum upgradability in mind. We are planning to boost the memory of these workstations to capacity to better handle the increased data loads that are present today. Each workstation will be boosted to four to six GB of RAM. Estimated Cost: \$500

Finally, NHI is looking to replace or add several LCD flat screen monitors to our inventory; thus replacing the rest of our older CRT monitors with more energy efficient and higher quality display devices. Plus our GIS Analysts will benefit from the use dual monitors to enhance their production of digital products. Estimated Cost: \$460

## **Installation and Maintenance:**

In addition to the hardware costs associated with this upgrade, there is also significant cost to install and maintain these improvements. Not only must the new hardware be physically installed, operating systems must be installed and configured, new gigabit Ethernet cabling must be run, and network protocols must be reestablished between devices. Estimated Cost: \$28,822

The total cost of the NHI system upgrades, including hardware purchase, installation and maintenance is \$ \$64,294.

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