AQUATIC DATA ANALYSIS

Federal Aid Project F-239R-13

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Job Progress Report

Colorado Division of Wildlife

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State: Colorado

Project No. F-239R-12

Title: Aquatic Data Analysis

Period Covered: July 1, 2005 to June 30, 2006

Study Objective: To develop analysis of aquatic biological data that accurately describes
                       and/or predicts the status of fish communities and the results of
                       management actions on these communities.

Study Objectives:

  Job 1. Aquatic Data Management System (ADAMAS)

  Objective: To continue to develop and maintain a computer based, statewide aquatic
                   data management system which will facilitate standardized entry of survey
                   data across the state and access to information regarding all aspects of
                   aquatic data including stream and lake inventories, Scientific Collections
                   (SCICOLL) reports and creel surveys. Active links between ADAMAS
                   and the Aquatic Animal Health (AAHL) database as well as between those
                   two databases and the Division Hatcheries database, TRANS5 will be
                   established and maintained. This job includes aspects of the aquatic
                   portion of the Colorado Vertebrate Ranking System (COVERS).

  Job 2. Technical Assistance

  Objective: To provide technical assistance to researchers, field biologists, and staff on a
                   variety of aquatic data analysis topics. Topics to include creel survey,
                   inventory survey, management categorization, recording of accurate location
                   data through the use of Global Positioning Systems (GPS), hardware and
                   software review, application development and other computer related data
                   analysis needs.

Job 1. Aquatic Data Management System (ADAMAS)

We are continuing the effort to collect and enter current and historic fisheries survey data stored at various Division offices, verifying locations and comparing those to data from previously entered surveys.

As we add surveys, we verify, reconcile and consolidate location information and cull duplicate survey and sample records. The database now includes 15,667 surveys at 11,292 locations, with 525,529 samples. Although this appears to be a very small increase in the last year, the totals tend to fluctuate as data is verified within the database and duplicate records are culled.

We are currently bringing surveys from 2003, 2004 and 2005 into the system. After compiling data and culling duplicates, we are about to add 2,425 surveys performed at as many as 2,000 new locations across the state. The 178,342 additional sampling records from these surveys will bring the database current with reported surveys from Division personnel and SCICOLL permit holders.

The ADAMAS Application

Standardization of data recording, entry, analysis and reporting remains the target of the ADAMAS application. A committee of Aquatic Section field biologists is tracking the requested, field-user features of the Graphic User Interface (GUI), monitoring standardization of report formats, and reviewing calculations used in the standard analyses available within the program. We have contracted with Gnomon, Inc. of Carson City, Nevada to provide coding of the system, taking advantage of their experience with Division's aquatic data as well as Microsoft's network and database management software packages.

During this reporting period, Gnomon has delivered two more test builds of the application which have all been tested and commented on for problems. The anticipated "final" test version of the application failed to provide the desired analysis results from a standardized set of test data. Given the length of time this has project gone on, the availability and acquisition of a better programming and database management environment in the Division and the frustrations of biologists and the database manager, the Senior Aquatic Staff is considering ending the contract and moving towards expanding the "interim" application to suit the needs of the Division's biologists.

As we have described in previous reports, the application's design was set up in two phases. The first phase was to get the application into the field with standardized entry and reporting intact. The second phase, inclusion of an updated, Windows-based version of the Creel Survey Analysis Program (C-SAP).

In the case of the second phase, Dr. George Schisler, a Division Aquatic Researcher, has contracted with Colorado State University students to translate the C-SAP program into the desired, Windows-based application. Testing the application with actual field data is underway with very good results, so far. The application allows you to import the DOS-based version's data format, stores to Microsoft Access database tables (rather than the native, binary files of the previous version) that are consistent with the ADAMAS system and provides improved flexibility in analysis strata and calendar manipulation.

Data Requests

Data requests from the database are filled in a timely manner, formatted as requested with priority given to support Division research and management needs. External government agencies, consultants, contractors and educational researchers are accommodated as expeditiously as possible.

Although this remains a manual process for the most part, the development of data release policies has resulted in a centralized process for review of requests by the Senior Aquatic, Species Conservation and Water Quality biologists prior to release of data. The requestor, through a standardized request form, is made aware that the data should only be used for the intended purpose, that, due to the ongoing development of database, data is under constant review, and that the data received should not be further distributed. The review can result in a denial, a smaller dataset or less resolution than requested, but a record of the request and an archive of the data sent is retained. This hasn't reduced the number of requests as much as anticipated, but has resulted in an improved method of communication between requestors and the Division, as well as a reduction in concerns for data distributed or possibly changed by the requestor.

Job 2. Technical Assistance

The primary activities on Job 2 during this reporting period were:
1) advise researchers concerning additional components and upgrades to desktop and laptop computers
2) service-oriented tasks supporting the researchers' projects such as scanning aerial photography for analyses and photographs for use in presentations to public or professional groups
3) assist researchers with programming needs, as in the development of an Access database used as a virtual, intermediate work area to process water quality data between the instrument that conducts the analyses and records the results and the server-based database used by our parent organization, Department of Natural Resources, to store and serve the results across the internet.

The changes in available data storage devices and management software - moving from a PC-based database backed up to tape systems, CD writers and DVD writers to a server-based Relational Database Management System (RDBMS) on the network that is routinely backed up, mirrored and maintained by our IT staff - has improved the database' reliability. This combined with less expensive storage costs, has made the concept of archiving scanned images of hard copy reports and photographs more desirable as those documents and images become readily available as referential support to on-going projects.

In the past year, we have begun scanning and cataloging a library of photographic slides made during research efforts over the last 30 years in an effort to reduce storage space, retain the images and make them available for future reference and presentations.

As the typical desktop computer becomes more powerful, production of digital presentations has moved from external service-oriented firms to in-house production. The scanning of photographs for inclusion in a PowerPoint presentation, for example, has gone a step further. We now graphically create captions as well as superimpose analytical charts on the images for inclusion in presentations, reports and workbooks.

Since the standardization of operating systems and the basic office suite of programs to Windows 2000/Windows XP operating systems and the XP Office suite, the resulting level of "peer support" continues to develop within the Division and Aquatic Research Group, redefining the group's technology support needs. We will continue to adapt to the situation, providing what informal support is required.