

# Aquatic Data Analysis

Federal Aid Project F-239R-20

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Federal Aid in Fish and Wildlife Restoration

Job Progress Report

Colorado Parks & Wildlife

Aquatic Wildlife Research Section

Fort Collins, Colorado

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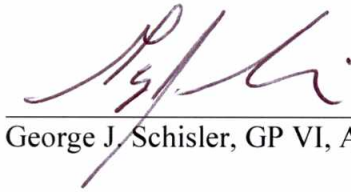
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9/5/13

*The results of the research investigations contained in this report represent work of the authors and may or may not have been implemented as Colorado Parks & Wildlife policy by the Director or the Wildlife Commission.*

## Table of Contents

Signature Page .....	ii
Title Page .....	1
Study Objective.....	1
Job No. 1 Aquatic Data Management Systems	
Objective.....	1
ADAMAS Data Base Management and Maintenance.....	1
The ADAMAS Application .....	3
Data Requests.....	3
Job No. 2 Technical Assistance	
Objective .....	5
Appendix A: Current Data Request Form .....	6
Appendix B: Supplementary Data Questionnaire .....	7
Appendix C: Current CPW Electronic Data Sharing Agreement .....	8



State: Colorado

Project No.: F-239R-20

Title: Aquatic Data Analysis

Period Covered: July 1, 2012 to June 30, 2013

## STUDY OBJECTIVE

To develop baseline data and analyses of aquatic biological data that accurately describe and/or predict the status of fish communities in Colorado, as well as the potential results of management actions on these communities.

### JOB NO. 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 CPW stream and lake inventories, Scientific Collections (SCICOLL) reports and CPW 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 (TRANS6) have been established and will be maintained.

### ADAMAS Database Management and Maintenance

We are continuing with the effort to collect and enter both current and historic fisheries data from field survey sheets stored at various Division offices. At the beginning of this reporting period, the database held 28,274 surveys at 11,275 locations across the state, with 1,854,660 fish sample records, representing 4,706,685 fish.

During the reporting period, we've added 2,034 surveys from 932 new and 286 existing locations, with 132,466 sampling records representing 347,067 fish. Of those, 139\* surveys were performed by CPW biologists during the 2012 field season with another 487 surveys from SCICOLL reports during 2012.

The following table shows current survey entry totals with survey and sampling records and representative fish processed for each calendar year.

### Surveys Processed by Calendar Year

Year	Surveys	Sample Records	Fish
Pre-2003	21,104	874,383	3,072,063
2003-2004	1,343	81,518	153,132
2004-2005	906	73,114	140,513
2005-2006	1,156	95,372	208,035
2006-2007	1,272	113,329	251,802
2007-2008	1,027	108,490	195,193
2008-2009	1,365	168,198	299,570
2009-2010	1,027	120,606	172,643
2010-2011	1,128	216,436	356,915
2011-2012	1,115	144,293	235,920
2012-2013*	842	76,220	171,330
<b>Total</b>	<b>32,285</b>	<b>2,071,959</b>	<b>5,257,116</b>

\* Note that due to delays relating to the retirement of Harry Vermillion and the implementation of the new ADAMAS application, not all of the 2012 CPW aquatic data had been received and uploaded to the database at the time of this report.

We continue to bring aquatic data into the system from a variety of sources. Initially, the database was comprised of records from the CDOW Stream and Lake Databank (the predecessor to ADAMAS) compiled by David Weber. In the 90's, a database of historical sampling, compiled by Dr. Kevin Bestgen, to support the South Platte and Arkansas Basins' Eastern Plains Native Fishes reports was incorporated. Since 1993, CPW biologists and SCICOLL permit holders have submitted annual reports for inclusion into the database. The original ADAMAS database was designed around basic parameters collected in the field with enough flexibility to support the variety of inventory sampling protocols used by aquatic biologists, researchers and consultants across the state. We continue to standardize field data reporting formats based on that design, allowing for expansion to accommodate new methods and projects.

We are also continuing with the effort to systematically review area office hardcopy files, scanning field data sheets to PDF for entry by database staff. As surveys are processed, sampling information is verified and compared to data from previously entered surveys. From time to time, historic survey reports with more detail and individual fish data are found to replace previously recorded, summary information.



Several related efforts affecting the ADAMAS database and CPW aquatic data as a whole have taken place during this reporting period:

- Andrew Treble was hired to replace Harry Vermillion, who retired at the end of June, 2013. Andrew was hired in March and was able to work alongside Harry for his last few months. Andrew has extensive fisheries and database management experience, working previously for Fisheries and Oceans Canada and the Great Lakes Fisheries Commission on the Laurentian Great Lakes. He also brings a much-needed quantitative fisheries background to the position.
- Reliance on the Jake-O-matic to perform analysis and import text data into the database was discontinued. Standardized Microsoft Excel templates were developed for use by Scientific Collector's Permit holders and CPW staff alike to submit their data for inclusion into ADAMAS.
- Taber Technologies, Inc was awarded the bid to merge the data tables supporting ADAMAS and the TRANS6 (Hatcheries) databases and migrate the data to a new 2008 SQL server. In addition, Taber Technologies developed a graphical user interface (GUI) which will allow regional biologists to now enter, review, and analyze their own data. The application will also greatly improve on the reporting and analysis capabilities of the former Jake-O-matic software program. CPW staff are in the final testing stages with this new software and anticipate moving to the permanent production server before the end of August, 2013.

### The ADAMAS Application

Standardization of inventory sampling data entry, analysis and reporting continues to be the primary target of an ADAMAS application within the AQDB. As we have described in previous reports, the applications' designs and implementation were set up to take place at a rate of one application per year, with the Hatcheries production application to be implemented first, followed by ADAMAS, a network-accessible version of C-SAP (creel survey analysis) and then a network-accessible application for the AAHL (disease inspections and certifications).

At this time, TRANS6, the Hatcheries' application, has been implemented with the portion of the planned AAHL application that deals with disease certification and management of the "Level 1" data within the AQDB. The ADAMAS application is in the final testing stages and will be migrated to the full production server within weeks of this reports' submission.

### Data Requests

Requests for aquatic data from the database continue to be filled in a timely manner, formatted as requested with priority given to support Division research and management needs. Federal, state and local government agencies, their consultants, contractors and educational

researchers are accommodated as expeditiously as possible. Angler requests are referred to Aquatic Area biologists and the Colorado Fishing Atlas.

This remains a manual process for the most part; a summarization process continues to prove valuable as a consistent format for providing requestors with information about sample inventories without having to provide “raw” data to requestors who the Aquatic Data Request Group (described below) have determined not to need that level of detail in the data provided.

The centralized process for review of requests by the Division’s biologists prior to release of data continues to be revised. At this point in time, a formal request is made via email with the CPW Aquatic Data Request Form (Appendix A). The form is meant to allow the requestor to define waters or geographic area of interest while also advising the requestor of the provisional status of the data and their responsibilities as to redistribution of the data. A second questionnaire has been added to the request form (Appendix B) to further define the resolution (both temporal and spatial) required and the justification for raw data when requested.

The request, and often the data requested, is distributed to the Aquatic Data Request Group via email for review and comment. The members include the Aquatic Research Leader, the regional Senior Aquatic Biologists, the Water Unit Manager, the regional Senior Wildlife Species Conservation biologists, the regional Aquatic or Water Quality Wildlife Species Conservation biologists, the Aquatic Toxicologist, the Aquatic GIS Specialist and the Aquatic Database Manager. The members of this group are aware of aquatic issues statewide and are all in contact with Aquatic Area biologists responsible for the management of waters in the requestor’s area of interest. Discussions have taken place among the members via email to determine how the request is to be filled. Once everyone is in agreement, or has deferred decision-making on the request to other members of the group, a data sharing agreement is sent to the requestor to sign (See Appendix C). This form simply states that the data will not be passed to a third party and that raw data, when distributed, will not be displayed or published in its raw form. Once this signed agreement is on file, the request is filled electronically via email. The request deliverable, the request form and a copy of the email discussion are archived for future reference.

Forty-four data requests from outside agencies and private companies were filled during the period covered by this report.

## JOB NO. 2 TECHNICAL ASSISTANCE

Objective: To provide technical assistance to researchers, field biologists, and staff on a variety of aquatic data management and data analysis topics. Topics include creel survey, inventory survey, management categorization, spatial analysis (GIS), hardware/software review, statistical analysis, application development and other data analysis needs.

The primary activities relating to this during this reporting period were:

- 1) Serving as the coordinator for the development and testing of the ADAMAS application. Acting as the primary contact between CPW and the vendor, compiling a list of bugs from users and monitoring the results of new beta versions.
- 2) Training biologists and researchers in the use of the new ADAMAS application, including components of data entry, data template upload, summary reports and analysis.
- 3) Assisting researchers with data and programming needs (i.e. development of Access databases for Eastern Plains Research project, Human Dimensions Angler Survey).
- 4) Assisting with the design and testing of a CartoPac field-entry application, as well as the evaluation of other digital field data entry options.

Appendix A  
Current Data Request Form



REQUEST FORM FOR  
COLORADO PARKS AND WILDLIFE  
AQUATIC DATA

1. (a) Name (s) of persons requesting data:

\_\_\_\_\_

1. (b) Organization/Company/Agency Name (s):

\_\_\_\_\_

1. (c) Organization/Company Agency Contact Information:

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_ email: \_\_\_\_\_  
(Email address is where electronic data files would be sent)

1. (d) Ultimate person/organization asking for the data (i.e. if a consultant is making this request, who is the client?):

\_\_\_\_\_

2. (a) We are requesting data for the following water bodies/geographic area:

\_\_\_\_\_  
(Note that CPW does not typically distribute point-sample locations or generate GIS maps)

2. (b) Describe the data you are requesting (fish species distributions? Water quality parameters?):

\_\_\_\_\_

3. Please describe your intended use for this data:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. You are advised of the following regarding the requested data:

(a) the data may be exempt from the Colorado Open Records Act, in which case, CPW may deny your request (refer to CORA for exemptions)

(b) the data may be in provisional status (i.e., error check still in progress)

(c) raw data values should not be changed. If you have original or copies of data sheets or previous exports with differences in the data you receive, please call or email for possible corrections.

(d) Do not redistribute this data to parties not listed above. Other parties must submit a formal request to CPW to insure that they receive the most updated version of the data available.

Name of CPW Contact: Andrew Treble  
EMAIL: andrew.treble@state.co.us  
PHONE: 970-472-4372

Date data sent to email address listed in 1 (c). :

Appendix B  
Supplementary Data Questionnaire



COLORADO PARKS & WILDLIFE

317 W. Prospect • Fort Collins, Colorado 80526  
(970)472-4372 • (970)472-4457/4458  
wildlife.state.co.us • parks.state.co.us

**Resolution of CPW Aquatic Data Request**

In order to speed up the approval and data distribution process, please take an extra moment or two and further define your data needs. While we will strive to give you the data you have requested in a timely manner, keep in mind that the lower the resolution of your data request, the less scrutiny (and thus time) required by the data request review committee, and also the more likely that your request will be approved. Note that requests for raw data will need to demonstrate this need to the committee before approval will be granted.

Please mark/highlight the resolution you require and return to [Andrew.Treble@state.co.us](mailto:Andrew.Treble@state.co.us)

What level of fish data are you requesting (Species Resolution):

- (1) Species Occurrence (For all species? For specific species?)
- (2) Species numbers, size ranges, population estimates, and biomass
- (3) Data on individual fish collections
- (4) Creel Survey Data?

At what scale do you want this data summarized (Spatial Resolution):

- (1) Basin (6 digit HUC)
- (2) Sub basin (8 Digit HUC)
- (3) Watershed (10 Digit HUC)
- (4) Sub-Watershed (12 digit HUC)
- (5) Catchment
- (6) Individual Survey Sample points

How far back do you want to go (Temporal Resolution):

- (1) Only the most recent surveys
- (2) Back to a specific year?
- (3) All data in the CPW Aquatics Database

Additional Explanation or requirements:

Appendix C  
Data Sharing Agreement Template



COLORADO PARKS & WILDLIFE

317 W. Prospect Rd, Fort Collins, CO 80526  
970-472-4300 • 970-472-4457  
wildlife.state.co.us • parks.state.co.us

**Non-disclosure Agreement for the Use of Colorado Parks and Wildlife  
Electronic Information**

- 1) Colorado Parks and Wildlife (CPW) will provide information on point locations of aquatic species, statewide, as requested by XXXXXXXXXXXXXXXXXX of XXXXXXXXXX for the purposes of XXXXXXXXXXXXXXXXXX. These data will be used solely by XXXXXXXXXXXXXXXXXX for the purpose of this project and are not to be distributed to a third party.
- 2) CPW, for management and conservation reasons, considers this information confidential and sensitive due to the elements' vulnerability to intentional and unintentional disturbance and due to agreements made with individual landowners to protect their privacy.
- 3) We, the undersigned, acknowledge that the information noted above is considered sensitive and confidential, and agree to the following stipulations:
  - a. The information described above will be accessible to XXXXXXXXXXXXXXXXXX and to no other entity, nor will it be made available for public viewing.
  - b. The information may not be transcribed or reproduced in any manner, unless authorized by a staff person at CPW. XXXXXXXXXX may display locations spatially if necessary to their stated purpose, but agrees to do so in a manner and at a scale where specific locations of individual points cannot be derived.
  - c. The information will be used for the requested purpose described above and for no other purpose. The information will be returned or destroyed upon completion of the purpose described above.
  - d. Requests involving biological interpretation or use of the information beyond the state purposes will be referred to CPW.

Signed by:

\_\_\_\_\_  
Colorado Parks & Wildlife (signature)

\_\_\_\_\_  
Data Requested By (signature)

\_\_\_\_\_  
(Please Print)

\_\_\_\_\_  
(Please Print)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date