

I. Project Title: **Upper Basin Database Management**

II. Bureau of Reclamation Agreement Number(s): N/A

III. Principal Investigator(s):

Travis Francis, Fish Biologist
Dale Ryden, Project Leader
764 Horizon Drive, Building B
Grand Junction, Colorado 81506
(970) 245-9319; FAX 245-6933
Email: travis_francis@fws.gov
dale_ryden@fws.gov

IV. Abstract: Development of a centralized database was a requirement of the Recovery Program when it was formed in 1986. All researchers and hatcheries who receive funding through the Recovery Program are required to submit all fishery data to the central database at the completion of their study or rearing season. This mandates that all researchers are required to submit a complete list of all endangered, native and non-native fish handled each year to the central database. Most data have been submitted and included into the centralized database through 2013.

V. Study Schedule: Scheduled to continue for the length of the Recovery Program.

VI. Relationship to RIPRAP: General Recovery Program Support Action Plan.
V.A.2. Conduct interagency data management program to compile, manage, and maintain, all research and monitoring data collected by the Recovery Program.

VII. Accomplishment of FY 2013 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Tasks:

Most of the UCRB database consists of ‘all fish’ data collected during the different investigations funded by the Recovery Program. These data relate to species, number of individuals collected, collection date, site, gear, effort expended, habitat and any other parameter associated with collection or stocking of that fish. Fish collection data from the field, radiotelemetry data, stationary PIT tag antennae data, and program funded propagation data are required to be submitted. The Recovery Program does not require submitting data from invertebrate, geomorphology, or laboratory studies. All fishery data associated with a study are due to the database when the final report is approved by the Recovery Program.

The database manager checks each file to ensure that the data conform to the required format. Future users will be referred to the reports for a complete description of the study design and conclusions of the original researchers. While an online GIS database has been developed for researchers to query the dataset, many researchers find the program to be not particularly user friendly and still query the database manager. This past year the database has been queried by recovery program researchers over one hundred times.

The database manager also distributes PIT tags to researchers as they request them and maintains a list of all tags and who receives the tags. PIT tag lists submitted by researchers are compared with this database to identify transcription errors. All errors can't be corrected, but at least a few errors can be eliminated before they are included in the basin-wide tagging list. Other errors are corrected when they are identified.

The database manager is also tasked with collecting and reporting all data associated with PIT tag antennas that were installed (8/13/2010) in the Colorado River at the Price-Stubb diversion dam within the fish passage structure at river mile 188.3. All these data will be reported in this annual report.

Accomplishments:

PIT tags have been distributed as researchers and hatchery managers have requested them. An Access database is maintained documenting distribution of all PIT tags that are sent to investigators in both the Upper Basin and San Juan Recovery Programs. With the new RFP in place, in 2012, and new tagging products available to the programs, we found that most researchers and hatchery personnel were interested in the new 'gun' style implanter and pre-loaded needles in trays. Both Dexter and the Grand Valley Unit of Ouray National Fish Hatchery (GVONFH) had the ability to hold fish for a period of time after using the traditional and new style (gun) implanters. Their results varied. GVONFH found that the new implanters provided for fewer delayed mortalities and less slipped tags. Dexter found a slight increase in delayed mortalities when using the new pre-loaded needles. However, considering each fish receives a new needle with the pre-loads, we believe that the new style implanters are the way of the future for hatchery and research applications. The trays are bulky and are going to require extra funds for distribution (shipping charges). It is estimated that shipping charges could cost an additional \$1,200 (or slightly higher) per year.

All tagging databases (stocking and river) are up to date through 2011 and most data from 2012 are included. PIT tagging data from 2013 should be coming in during the next month or so. Tagging data from 2012 and 2013 will be updated over the coming winter. All tagging and stocking databases have been converted to Access. We worked with Karen Holt to provide data for an online database that is available to researchers looking for information on specific PIT tag numbers or general information of distribution of rare

fish. We have also worked with the University of Missouri to include our data into USGS's GAP analysis program.

Efforts have continued to start bringing the 'other fish' data into consolidated Access files. They currently reside in a variety of Excel, Dbase, and Quattro Pro files. This will be a more complicated process because of the wide variety of data types that fall into this broad category.

Efforts in 2009 and 2010 concentrated on providing a consolidated database of all the nonnative fish data that has been accumulated since 2000. These consolidated data will play an important role in ongoing efforts to synthesize this important program in all rivers of the upper basin. This data has been updated through 2011 and have been handed over to CSU, the contract holder for the basin-wide synthesis. Data from 2012 non-native sampling has been received; however, has not been included into the database.

Additionally, efforts were made to consolidate the YOY Colorado pikeminnow monitoring data for a long term analysis. Data from the now terminated adult monitoring program were also consolidated into an Access file. Catch data from both the Grand Valley Water User's Fish Ladder and Redlands Water and Power Fish Ladder were consolidated into an Access database.

Investigators are not nearly as diligent about submitting the 'other fish' data as they are about submitting rare fish data, so we will need to update that information as it is received. We have been working with researchers to incorporate the more recent data. In addition, we need to update the list of studies that have data included in the database. Work on updating the database is continually ongoing.

Price-Stubb Antennae

The Price-Stubb PIT tag antennas produced multiple hits on 428 unique PIT tags during FY 2013, the most detections during any fiscal year (table 2). We reported in 2010 that the close placement of each of the four antennas (~10 inches) complicated determining directionality (upstream vs. downstream). After cleaning the passageway, in late June of 2011, of all of the debris from spring high water, Audrey Hopkins of Biomark adjusted some of the settings at the unit. She changed the antenna sequence (AS) from 1,2,3,4,0,0,0,0,0,0,0 to 1,3,1,3,1,3,2,4,2,4,2,4 and adjusted the delay time from 100mS to 45mS. These adjustments have provided more resolution for determining directionality from detections. There are still some unknowns; however, not as many as were previously encountered. For FY 2013; 19% (n=89) of the fish passed the antennas heading upstream, 29% (n=132) in an undetermined direction, and 52% (n=242) in a downstream direction. Bonytail (n=138, *Gila elegans*), roundtail chub (n=79, *Gila robusta*), Colorado pikeminnow (n=2, *Ptychocheilus lucius*), razorback sucker ([n=239, *Xyrauchen texanus*] one of which was stocked in the Green River and swam over 308 river miles in one year), flannelmouth sucker (n=1, *Catostomus latipinnis*), and four

unidentified PIT tags were detected during FY2013. The following (table 1) gives a detailed breakdown of the fish that were detected by the antennas:

Table 1

month of Detection	Direction	Year Detected/Species	Number of Fish	History
October	Upstream	BT	2	N = 43 stocked in 2012 sometime during summer by Mumma waiting on data submission.
	Unknown		19	
	Downstream		22	
	Upstream	RZ	2	N=92 stocked in Sept. 2012 at Rifle Bridge RMI 240.7 N=5 tags distributed to GJ Hatchery in 2012– missing stock data
	Unknown		37	
	Downstream		58	
	Upstream	RT	0	N=1 tagged in Oct. 2008 at Black Rocks.
	Unknown		0	
	Downstream		1	
November	Upstream	BT	0	N = 15 stocked in 2012 sometime during summer by Mumma waiting on data submission N = 1 stocked in 2011 at RMI 194.4 in Debeque Canyon in September.
	Unknown		6	
	Downstream		10	
December	Upstream	BT	0	N=10 stocked in 2012 sometime during summer by Mumma waiting on data submission N = 1 stocked in 2011 at RMI 194.4 in Debeque Canyon in September.
	Unknown		4	
	Downstream		7	
	Upstream	RZ	0	N=2 stocked in Sept. 2012 at Rifle Bridge RMI 240.7.
	Unknown		0	
	Downstream		2	
	Upstream	RT	0	N=1 tagged in Oct. 2011 at Black Rocks.
	Unknown		0	
	Downstream		1	

January	Upstream	BT	0	N= 1 stocked in 2012 sometime during summer by Mumma waiting on data submission.
	Unknown		1	
	Downstream		0	
March	Upstream	BT	0	N= 6 stocked in 2012 sometime during summer by Mumma waiting on data submission.
	Unknown		4	
	Downstream		2	
April	Upstream	BT	0	N= 1 stocked in 2012 sometime during summer by Mumma waiting on data submission.
	Unknown		0	
	Downstream		1	
	Upstream	RZ	1	N=1 stocked in Sept. 2012 at Rifle Bridge RMI 240.7, N=1 stocked Nov. 2009 at CO RMI 185.1.
	Unknown		0	
	Downstream		1	
May	Upstream	BT	1	N = 1 stocked in 2011 at RMI 194.4 in Debeque Canyon in September.
	Unknown		0	
	Downstream		0	
	Upstream	RZ	5	N=2 stocked in 2008 at CO RMI 185.1 (one of these fish was recaptured during the CS EST in 2009 and 2010), N=2 stocked in 2009 at CO RMI 185.1 (one of these fish was recaptured during SM removal in 2010) , N=1 stocked in 2009 at CO RMI 166.7, N=2 stocked in 2010 at Hoagland Conservation Easement RMI 227.6, N=1 stocked in 2011 at Hoagland Conservation Easement RMI 227.6, N=4 stocked in Sept. 2012 at Rifle Bridge RMI 240.7.
	Unknown		4	
Downstream		3		
Upstream	RT	14	N=5 tagged in Fall 2008 at Black Rocks CO RMI	
Unknown		2		

May Cont.		RT Cont.		136, N=2 tagged in Fall 2011 at Black Rocks CO RMI 136, N=5 tagged in Fall 2012 at Black Rocks, N=5 tagged in Fall 2011 at Westwater CO RMI 120's, N=2 tagged in Fall 2012 at Westwater CO RMI 120's.
	Downstream		3	
	Upstream	Unknown	0	N=1 tag not from recovery program.
	Unknown		0	
	Downstream		1	
	Upstream	2013 FM	1	N = 1 tagged in 2003 by CPW.
	Unknown		0	
Downstream	0			
June	Upstream	RZ	2	N=3 stocked in 2011 at Hoagland Conservation Easement RMI 227.6, N=7 stocked in Sept. 2012 at Rifle Bridge RMI 240.7.
	Unknown		3	
	Downstream		5	
	Upstream	RT	24	N=1 tagged in Fall 2007 at Black Rocks CO RMI 136, N=2 tagged in Fall 2008 at Black Rocks CO RMI 136, N=10 tagged in Fall 2011 at Black Rocks CO RMI 136, N=3 tagged in Fall 2012 at Black Rocks, N=1 tagged in Fall 2005 at Westwater CO RMI 120's, N=1 tagged in Fall 2007 at Westwater CO RMI 120's, N=4 tagged in Fall 2008 at Westwater CO RMI 120's, N=3 tagged in Fall 2012 at Westwater CO.
	Unknown		1	
	Downstream		0	
	Upstream	Unknown	0	N=1 distributed to UDWR Moab 11/8/2010.
	Unknown		1	
	Downstream		0	
	July	Upstream	RZ	4
Unknown			1	

July Cont.		RZ Cont.		185.1, N=2 stocked in 2011 at Hoagland Conservation Easement RMI 227.6, N=1 stocked in 2011 at Rifle Bridge RMI 240.7, N=1 stocked in 2011 at Corn Lake RMI 177.4 N=1 stocked in 2012 at Rifle Bridge RMI 240.7.
	Downstream		1	
	Upstream		3	
	Unknown		3	
		RT		N=3 tagged in 2011 in Westwater at CO RMI 120's, N=1 tagged in 2012 in Westwater at CO RMI 120's, N=3 tagged in Fall 2008 at Black Rocks CO RMI 136, N=6 tagged in Fall 2011 at Black Rocks CO RMI 136, N=4 tagged in Fall 2012 at Black Rocks CO RMI 136, N=1 tagged in Fall 2013 at Black Rocks CO RMI 136.
	Downstream		12	
August	Upstream	BT	4	N= 29 stocked in 2012 or 2013 sometime during summer by Mumma waiting on data submission.
	Unknown		10	
	Downstream		15	
	Upstream	CS	1	Same fish went upstream and downstream during August. N=1 Male tagged 5/10/1995 GR RMI 254.0, recaptured twice in 1999 CO RMI 174-178, recaptured 5/16/2003 CO RMI 187.6, recaptured 5/26/2005 CO RMI 170.5, recaptured 4/22/2009 CO RMI 192.9, detected twice at Price Stubb Antenna in 2012.
	Unknown		0	
	Downstream			
	Downstream		1	
Upstream	RZ	6	N=1 stocked in 2009 at	

August Cont.	Unknown	RZ Cont.	1	Henderson's Launch RMI 185.1 (detected 4 times at antenna in August 2013), N=2 stocked in 2010 at Hoagland Conservation Easement RMI 227.6 (N=1 detected 3 times at antenna in August 2013), N=2 stocked in 2011 at Hoagland Conservation Easement RMI 227.6, N=1 stocked in 2011 at Corn Lake RMI 177.4 N=1 stocked in 2012 at Rifle Bridge RMI 240.7.
	Downstream		3	
	Upstream		3	
	Unknown	RT	0	N=2 tagged in Fall 2012 at Black Rocks CO RMI 136 (N=1 was detected twice at antenna in August 2013).
	Downstream		0	
	Upstream	Unknown	1	Tags distributed to CRFP GJ, waiting on fish data submission.
	Unknown		1	
	Downstream		0	
September	Upstream	BT	5	N= 31 stocked in 2012 or 2013 sometime during summer by Mumma waiting on data submission.
	Unknown		9	
	Downstream		17	
	Upstream	RZ	9	N=1 stocked in 2009 at CO RMI 176.2 (detected 2 times at antenna in September 2013), N=3 stocked in 2010 at Hoagland Conservation Easement RMI 227.6, N=3 stocked in 2011 at Hoagland Conservation Easement RMI 227.6, N=1 stocked in 2012 at Green River State Park GR RMI 120, N=91 stocked this year data hasn't been submitted .
	Unknown		25	
	Downstream		66	
	Upstream		1	
		RT		

September Cont.	Unknown	RT Cont.	0	2011 at Black Rocks CO RMI 136.
	Downstream		0	

Table 2

Species	# of Individuals FY2010*	# of Individuals FY2011**	# of Individuals FY2012**	# of Individuals FY2013**
BT	0	16	88	138
CS	2	1	8	2
FM	0	1	3	1
HB	0	0	1	0
RT	6	19	36	79
RZ	0	83	135	239
* Antennas were only in operation for 1.5 months during FY 2010				
** Some of these fish were detected more than once during the fiscal year				

VIII. Additional noteworthy observations: See above.

IX. Recommendations: Continue to identify and acquire data sets that belong in the centralized database. Continue collecting data from Price-Stubbs antennas. Consider additional budgeting for Operation and Maintenance charges associated with the Price-Stubbs antennas (~\$5,000 safety net). Consider providing additional funds for distributing (shipping) the trays with pre-loaded needles (~\$1,200) to hatcheries and researchers. Consider BOR RFP for a centralized database for all PIT tags put into Upper Colorado and San Juan Rivers by the UCRRP, SJRRIP, and individual states conducting 3 species work, universities, and private consultants. Current data queries are more difficult to fulfill because of the many sources of tags and the lack of a centralized tag distribution database from all of these sources. In addition, mandate that field stations working with more than one source of tags use only program acquired tags in endangered fish – and to not use program acquired tags in projects that are not funded by the respective programs.

X. Project Status: Project is currently behind schedule, but is catching up. Scheduled to continue through the length of the Recovery Program.

XI. FY 2013 Budget Status

- A. Funds Provided: 60,846
- B. Funds Expended: 60,846
- C. Difference: -0-
- D. Percent of the FY 2012 work completed, and projected costs to complete: 80%
- E. Recovery Program funds spent for publication charges: -0-

XII. Status of Data Submission (Where applicable): Price Stubb antenna data will be submitted to UCRRP database manager by January 2013.

XIII. Signed: Travis Francis 11/12/2013
 Principal Investigator Date