

Fish Population Monitoring Workgroup Meeting

Thursday, March 23, 2017 from 2:00 pm to 4:15 pm

Location:

DBS&A
Albuquerque
Office

**Meeting
called by:** R. Billings

Facilitator: B. Salvas

Invitees: Rick Billings (ABCWUA), Thomas Archdeacon (FWS), Dave Campbell (FWS), Jason Davis (FWS), Thomas Sinclair (FWS), Grace Haggerty (ISC), Rich Valdez (SWCA/ISC), Jennifer Bacchus (USBR), Eric Gonzales (USBR), Brian Hobbs (USBR), Ann DeMint (USBR), Michael Porter (USACE), Susan Bittick (USACE), David Gensler (MRGCD), Anne Marken (MRGCD), Matthew Wunder (NMDGF), Debbie Lee (WEST), Mike Marcus (APA), Beth Salvas (DBS&A), Kenny Calhoun (DBS&A)

Attendees: Rick Billings (ABCWUA), Mo Hobbs (ABCWUA), Thomas Archdeacon (FWS), Jason Davis (FWS), Grace Haggerty (ISC), Rich Valdez (SWCA/ISC), Eric Gonzales (USBR), Brian Hobbs (USBR), Susan Bittick (USACE), Michael Porter (USACE), Justin Reale (USACE), Mike Marcus (APA), Matthew Wunder (NMDGF), Debbie Lee (WEST), Beth Salvas (DBS&A), for DBMS discussion only-Kenny Calhoun (DBS&A)

Agenda Topic and Related Action Items

Thursday, March 23, 2017

1. Mike Marcus requested several members of the workgroup volunteer to prepare 1 to 2 scopes of work (SOW) about 1 page in length for future projects to be submitted to the Science Workgroup prior to their next meeting ~ April 10, 2017. Potential SOW would move forward for review and funding to Coordination Committee (CC) and then Executive Committee (EC).
2. Beth Salvas and Kenny Calhoun (DBS&A) provided an update on the database management system (DBMS) status. The Collaborative Program database management system has been funded by USACE for the past 7 years or so, but license will expire on March 31, 2017, and a contract is not in place to continue funding DBMS. The DBMS will be unplugged at close of business Friday March 31st at which time the calendar, data, maps, and associated documents will no longer accessible from the internet. DBMS hardware is at or near end of life and in need of upgrading, software query interface could be improved also. USACE will have funding sometime later in spring but the future of the DBMS is yet to be determined.

Several meeting attendees use the DBMS and would like to keep it accessible. Kenny estimates \$1,200 to \$1,500 per month is needed to keep DBMS online in the short term until a more long term solution is determined. Also to keep costs down, Kenny recommended any data updates be provided in the approved data submission templates available on the website:

<http://mrgescp.dbstephens.com/DataSubmissionTemplates.aspx>

Rick Billings will check whether ABCWUA may be able to fund the DBMS for a few months in the near term.

3. Beth Salvas provided a summary of 2016 fish population monitoring workgroup meetings and important events:

- **February 18, 2016** - Reviewed all comments to the January 27, 2016 draft *Summary of Findings by the External Expert Panelists: Rio Grande Silvery Minnow Population Monitoring Workshop*. Afterwards comments were compiled.
- **May 3, 2016** - Discussed approval of *Task 1 for Review of the Collaborative Program Fish Monitoring Program for the Rio Grande Silvery Minnow, A Proposal for a CPUE, Metrics and Methodologies Workshop* document. The group reached consensus that the next step was to begin Task 2 from the EC proposal. Each workgroup member was asked to look at the report recommendations and develop draft tasks and work efforts prior to the next meeting.

Wayne Hubert gave a May 19th presentation before EC on the summary of findings from the Workshop and document was finalized and available on website and emailed to workgroup.

- **July 12, 2016** - Discussed recommendations from the final *Summary of Findings by the External Expert Panelists: Rio Grande Silvery Minnow Population Monitoring Workshop* report with workgroup responses received prior to the meeting. The workgroup then ranked the recommendations regarding existing monitoring data (pre-2017):
 - Ranking of 3 = can be easily be completed by group or consultant with existing data
 - Ranking of 2 = not easily completed or limited by existing data, but possible
 - Ranking of 1 = extremely limited with existing data
 - Ranking of 0 = not possible with existing data

Based on consensus of the workgroup the following rankings were given to the expert peer review recommendations:

- Ranking = 3 for recommendations: 1a, 1b, 2, 3 (included in 1a), 4, 6c, 10a, 10b, 11a, 11b, and 12

- Ranking = 2 for recommendations: 5a, 5b, 6a, 6b, 14, 15/16, 17, and 18
 - Ranking = 1 for recommendations: 7a, 7b, 9, 19, 20/21, 22, and 24
 - Ranking = 0 for recommendations: 8, 13, and 23
- **August 23 2016** - Meeting for stakeholders only regarding USBR SOW for 2 year monitoring contract.
 - **December 5, 2016** - The U.S. Fish and Wildlife Service completed and released a new biological opinion (BO) providing Endangered Species Act coverage for water-related activities in the Upper and Middle Rio Grande.
4. The workgroup discussed the top ranked expert peer review recommendations from the July 2016 meeting:
- **1a** - Separate data and compute separate CPUE indices for the catch and effort data from the small-mesh and fine-mesh seines into two data sets
 - **1b** - Separate data and compute separate CPUE indices for individual age classes captured in each gear type
 - **2** - Compute length-at-age data and frequency histograms for cohorts
 - **3** - Include only larval fish in computing CPUE indices for catch from the fine-mesh seine
 - **4** - Omit dry sample sites as zero CPUE values from CPUE computations for RGSM
 - **6c** - Compute mean site-specific CPUE from individual seine hauls
 - **10a** - Use October data from 1993 to 2014 data in the mixture model to assess the relationship of hydrological covariates and estimates of the mean annual CPUE for RGSM
 - **10b** - Use the individual seine-haul approach data from October for 2006 to 2016 in the mixture model to assess the relationship of hydrological covariates and estimates of the mean annual CPUE for RGSM
 - **11a** - Fully define that the assumptions of the mixture models
 - **11b** - Document and interpret the influence wherever results of CPUE analyses potential violate the 11a assumptions
 - **12** - Increase the number of sampling sites (20-50 per reach) to improve accuracy of RGSM CPUE estimates and to allow reach-specific computations of CPUE estimates

USBR stated that ASIR had incorporated some of the above expert peer review recommendations (possibly recommendations 1a, 1b, 3, 4, and 10a) with 2016 data only, and have gone back previous years for recommendation 4.

Rich Valdez suggested refine or revise the CPUE for at least 5 years. Mike Marcus suggested using a range of wet and drought years. Michael Porter will review the

2016 report and identify which recommendations applied to 2016 should be used to go analyze previous years data. Rick Billings, Mike Marcus, and Michael Porter will meet in the next week to brainstorm ideas and then develop a SOW.

5. Rick Billings provided review of draft 2016 annual monitoring report, a good and dense report beneficial to adaptive management but also hard to read, need a better way to get the information to the decision makers and management. Mike Marcus suggested an executive summary prepared by participants and stakeholders would be useful, and had comments to draft to make it clearer. Rich Valdez noted the annual report driving the BO, has recommendations to improve the report if USBR interested, and suggested improved writing would make report easier to read.
6. Eric Gonzales provided update on pending monitoring contract and went over the handout prepared by Jennifer Bacchus responding to specific questions given to USBR prior to the meeting. The new monitoring contract is pending and in final review process. Monitoring should start in April. The new contract incorporates the following new items, recommendations from the science panel using feedback from this working group, while maintaining the integrity of the protocol for the long-term dataset:
 - Making February and December sampling an optional task line item
 - Increasing the number of sites to 30 sites for April and October sampling, to evaluate the effect on monitoring data from added sites (Option Year could increase to 60 sites in those two months, optional task depending on outcome of sampling 30 sites)
 - Detections of RGSM by mesh size, and specific to mesohabitat type, calculating CPUE by total catch rates, by age class (larval/YOY/non-YOY), and by mesh size
 - The use of replacement sites if any of the 20 standard sites are dry at the time of sampling
 - Reporting density estimates both including/excluding dry sites, and with/out replacement sites
 - Monthly sampling now at 7 months (March/April through October), plus continuing intensive in November
 - Reporting includes a table of assumptions that apply to the analyses, risk that assumption could be violated, steps taken to minimize that likelihood, and explaining potential impact
 - Additional sampling per seine haul as an optional task
 - Workshop as an optional task if needed

Grace Haggerty stated ISC would like to have a say in the additional monitoring site locations. Brian Hobbs noted that all options from the SOW were bid on in the selected proposal, but until the contract is awarded USBR could not provide the proposal details, answer specific questions of the workgroup, or coordinate with ISC on the additional site locations.

USBR provided a data table with the requested E(x) and mean values for Figure 7 in the 2016 report. The draft 2016 report has undergone the review period for comment and suggestions on reporting format and presentation. The next contract has reporting requirements that were the outcome of feedback and comment from this workgroup. Any additional reporting preferences for presentation of the data can be considered if no added cost.

7. Rich Valdez provided a discussion on recent analysis to better understand the variables leading to spawning by the Rio Grande silvery minnow in the Middle Rio Grande. Figures A and B were provided to illustrate the possible relationships between estimated spawning dates and river temperature and flow.

Figure A - Estimated Spawning Dates for RGSM and Temperature Degree Days in 2016, preliminary interpretations:

- In 2016, persistent daily spawning began 4/13/2016 at 771 TDDs and after a flow increase of 163 cfs/day
- A sharp increase in spawning was seen 5/8/2016 at 1,060 TDDs and a flow increase of 120 cfs/day
- The peak of spawning occurred 5/16/2016 at 1,263 TDDs and a flow increase of 160 cfs/day
- If river temperature and flow are driving variables for spawning dates of silvery minnow, it appears that the fish need about 771 to 1,060 TDDs and a daily flow change of about 120 to 160 cfs

Figure B - Flow and Projected Temperature Degree Days (2016 vs 2017), preliminary interpretations:

- TDDs for 2017 are following a similar pattern as for 2016, but are warmer on a daily basis by 13 to 36%; this is likely to advance initiation of spawning by a few days—unless the snow-melt runoff cools the river before sufficient TDDs are reached
- The early flow increase starting 3/11/2017 is not expected to cue significant spawning because TDDs are only ~500 (spawning occurred at 771 to 1,060 TDDs in 2016)
- Fish should be ready to spawn (i.e., mature ovaries) about 4/10/2017 to 5/1/2017 based on projected TDDs, but surge will probably be cued by daily flow change
- The 2016 information gives us some insight into possible spawning dates of silvery minnow for 2017; however, flow and possibly river temperature are different than 2016
- We cannot at this time reliably predict spawning dates for the silvery minnow, but should be able to reach reasonable projections with additional information from observed spawning in future years and from post-hoc analyses of data from past years

Why does the timing of spawning matter? Two main reasons:

- Being able to predict the start of spawning could allow water management to correspond river flow with spawning and maximize spawning success, survival of larvae, and recruitment
- Timing of the spawn establishes the annual survival curve for age-0 fish and fish density (CPUE) during population monitoring

Figures C and D were provided to illustrate the difference in CPUE as the year progresses and the fish experience natural mortality.

Figure C - Survival of Age-0 RGSM—2004, 2007, 2016:

- This figure shows the mean monthly CPUE and a negative exponential function fit to the data of each year such that the exponent e^{-Zt} represents the slope on a monthly time step; monthly survival is computed as $\text{Exp}(-Zt)$, where t = time in months.
- Mortality rates (i.e., slopes of the curves) are quite different for the 3 years—2004, 2007, and 2016.
- A point on a given curve is a prediction of the CPUE for age-0 fish at that time; e.g., July, August, September, or October.
- In years like 2007 and 2016, where CPUE was moderate, the difference for samples 1 month apart is nearly 3 fish/100 m². That could make a difference in the “October” CPUE.
- In a year like 2004, when CPUE is low, the difference is not as great (< 1 fish/100 m²) for samples taken 1 month apart.

Figure D - Survival of Age-0 RGSM—2005:

- This figure is provided to illustrate how big the difference in CPUE can be when the year-class is strong and fish density is high.
- The difference if samples were taken November 1 as opposed to October 1 is a CPUE of more than 9 fish/100 m² lower.

8. Michael Porter provided analysis of USACE 2013-2015 Albuquerque reach catch data for all fish (>16,000 total), and for the red shiner, flathead chub, and silvery minnow (898 total) individually. Paired histograms show the size distributions from the beach seine and bag seine. Overall the catchability results were:

- All fish: 60% beach seine and 40% bag seine
- Red shiner: 70% beach seine and 30% bag seine
- Flathead chub: 60% beach seine and 40% bag seine
- Silvery minnow: 40% beach seine and 60% bag seine

Another graph calculated the relative catchability of the beach seine as a percent of the total catch for each size class by analyzing the silvery minnows separately by standard length, showing that silvery minnows smaller than 22 mm were predominately caught by beach seine, while silvery minnows larger than 22 mm were predominately caught by bag seine. The results support the CPUE panel recommendation to use the monitoring program to assess age 0 trends. A technical report will be prepared after completion of more analysis.

9. Planning for April retreat was briefly discussed. The focus will be on program funding and not technical. WEST is planning and facilitating the event. Debbie Lee said 2 possibly 3 people will attend for each signatory.

Next Meeting

- Late May or early June after April sampling results are available, TBD

Action Items

- **All** - Provide 1 page scope of work project ideas to the Science group prior to April 10, 2017 Science Workgroup meeting (suggestion).
 - Mike Marcus, Rick Billings, and Michael Porter and will meet to discuss and prepare a SOW regarding analysis of the applicable top ranked expert peer review recommendations with existing data.
 - Rich Valdez and Michael Porter will prepare a SOW regarding temperature degrees days and potential relationship to peak of spawning and timing of October sampling.
 - **Rick Billings** - Determine if ABCWUA would be able to fund DBMS for a few months to prevent it from going offline COB Friday March 31, 2017.
 - **USBR** - Provide to ISC (Grace Haggerty) requested information regarding the selected 2 year monitoring plan proposal after the contract is awarded.
 - **Beth Salvias** - Send out meeting notes and conduct a doodle poll for next meeting date during late May or early June.
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